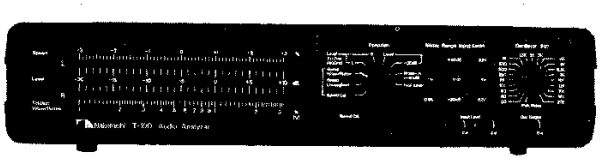
NAKA-00088

Nakamichi

Service Manual

Nakamichi T-100

Audio Analyzer



T-100

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1. GENERAL

1.1. Control Functions

The Nakamichi T-100 control functions are shown below:

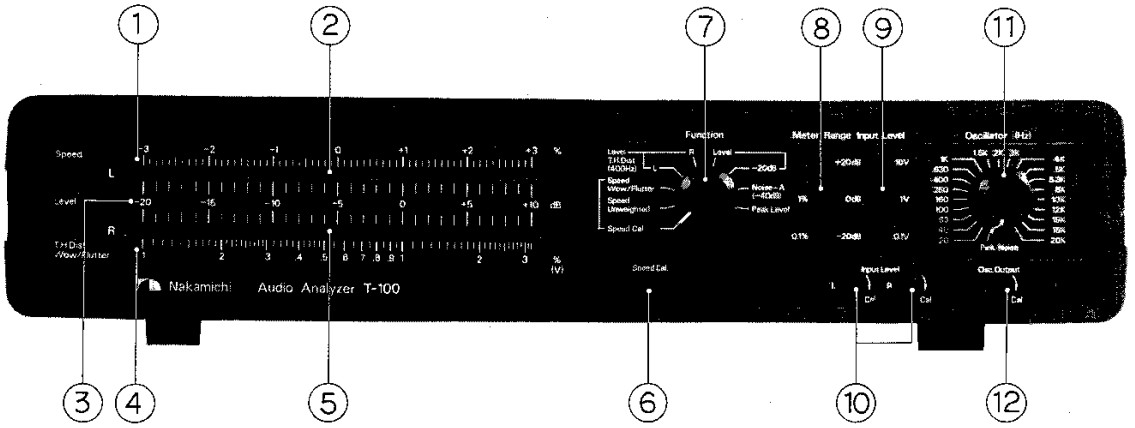

Fig. 1.1 Front View

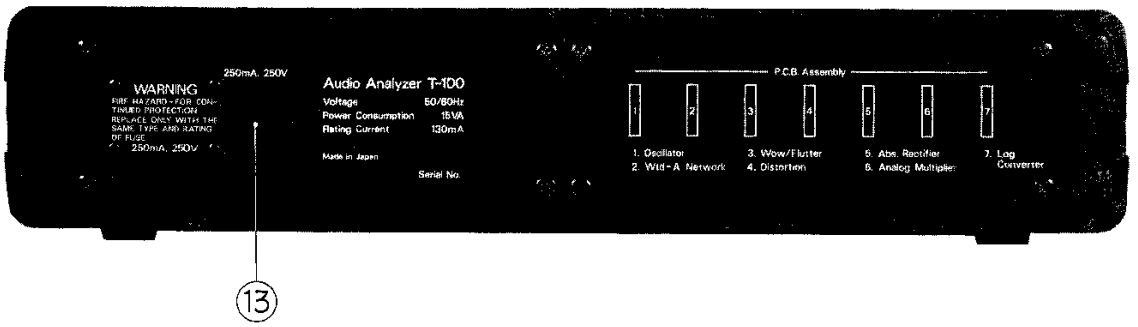

Fig. 1.2 Rear View

1. Speed Deviation Scale
2. Top Indicator
3. Level Scale
4. Bottom Indicator
5. Total Harmonic Distortion/ Wow & Flutter Scale
6. Speed Calibration Control
7. Function Control
8. Meter Range Switch
9. Input Level Switch
10. Input Level Controls
11. Oscillator Control
12. Oscillator Output Control
13. Fuse
14. Power Switch
15. AC Cord Connector
16. Input Jacks
17. Oscillator Output Jacks
18. Scope Output Jacks

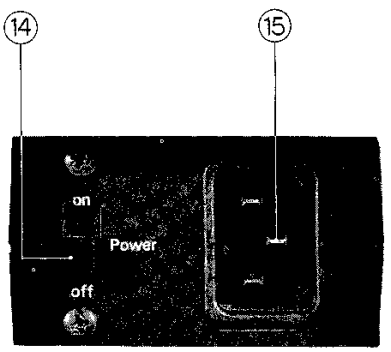

Fig. 1.3 Side View (Right)

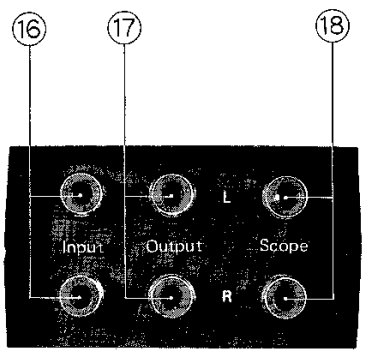

Fig. 1.4 Side View (Left)

1.2. Voltage Selector

Voltage selector is installed on the rear panel for Other Version of the Nakamichi T-100.
This voltage selector can select either 120 V or 220 - 240 V at customer's disposal.

1.3. Functions

T-100 contains 9 functions the details of which are as follows:
Figs. 1.5 - 1.13 show the signal path in each function.

(1) Speed Cal
Calibrates top indicator for zero speed deviation.

(2) Speed Unweighted
Selects speed deviation in the top indicator and unweighted wow & flutter peak on the bottom indicator.

(3) Speed Wow/Flutter
Selects speed deviation on the top indicator and weighted wow & flutter peak on the bottom indicator.

(4) Level T.H. Distortion L
Selects left channel level on the top indicator and left channel total harmonic distortion on the bottom indicator.

(5) Level T.H. Distortion R
Selects right channel level on the top indicator and right channel total harmonic distortion on the bottom indicator.

(6) Level
Selects left channel level on the top indicator and right channel level on the bottom indicator.

(7) Level –20 dB
Decreases oscillator output by 20 dB while simultaneously making the indicators 20 dB more sensitive.
Selects left channel level on the top indicator and right channel level on the bottom indicator.

(8) Noise –40 dB
Displays left channel A-weighted noise on the top indicator and right channel A-weighted noise on the bottom indicator.
Makes the display 40 dB more sensitive.

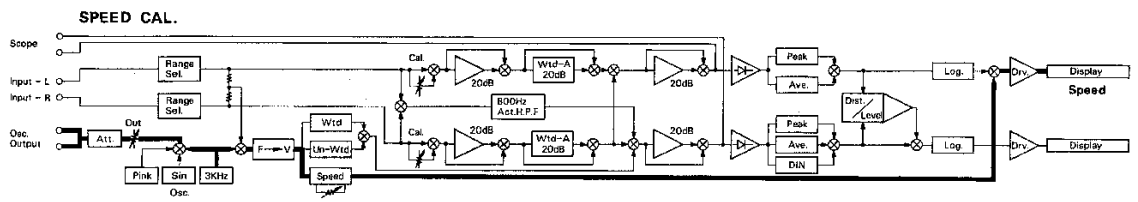

Fig. 1.5

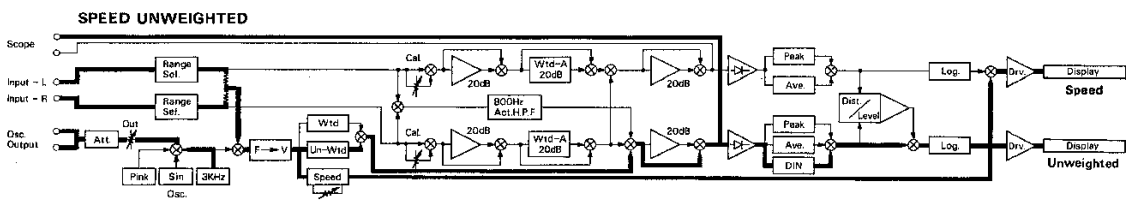

Fig. 1.6

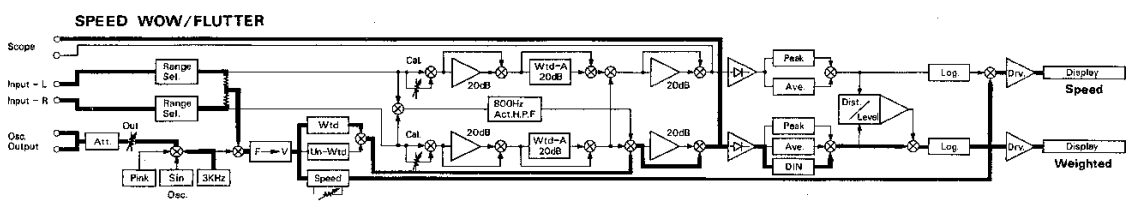

Fig. 1.7

(9) Peak

Selects peak-reading ballistics for the level display. Selects left channel level on the top indicator, right channel level on the bottom indicator. When the left and right input level controls are turned to maximum, the sensitivity of the display is the same as when the function control is set to "level".

However, by turning the input level controls counter-clockwise, you can reduce the sensitivity to any intermediate value.

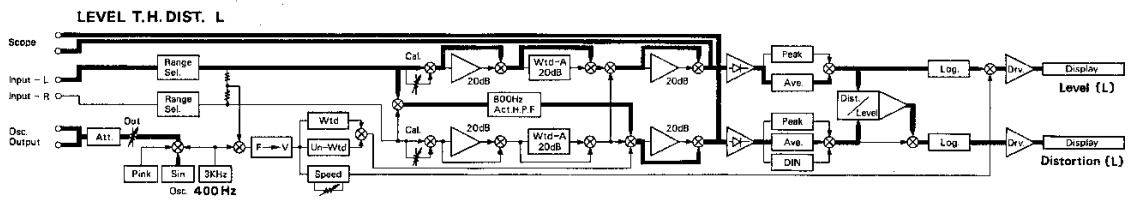

Fig. 1.8

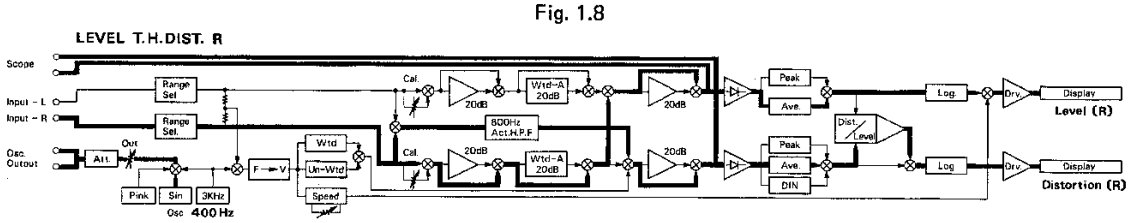

Fig. 1.9

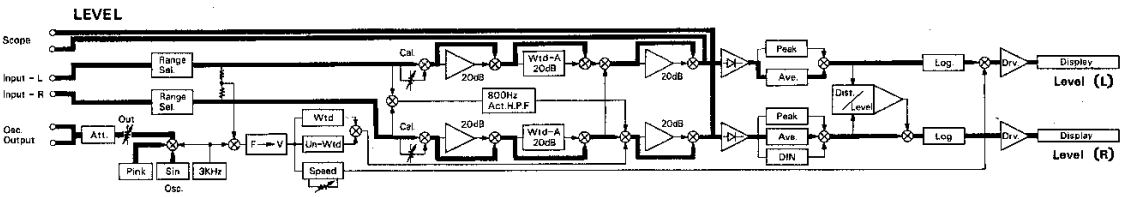

Fig. 1.10

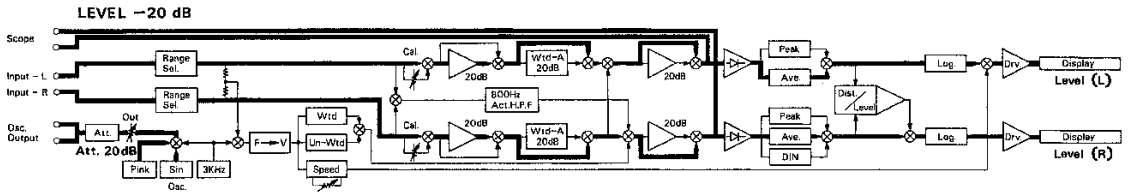

Fig. 1.11

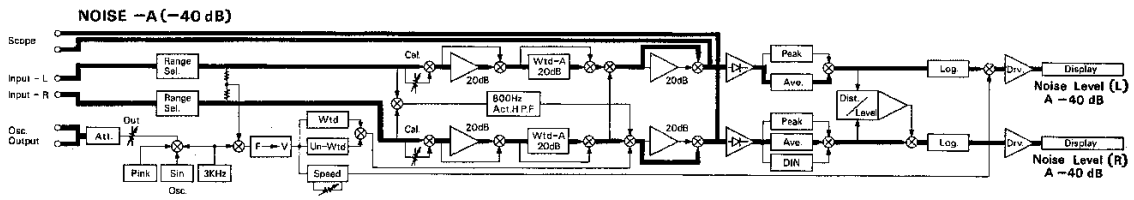

Fig. 1.12

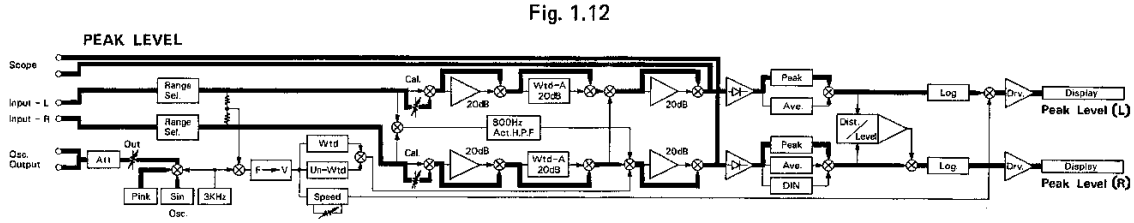

Fig. 1.13

1.4. How To Read Signals

In the Switch P.C.B. circuit, preceding 9 functions are symbolized as follows:

A: Speed Cal.
B: Speed Unweighted
C: Speed Wow/Flutter (DIN WTD)
D: Level T.H. Dist. (400 Hz) L
E: Level T.H. Dist. (400 Hz) R
F: Level 0 dB
G: Level −20 dB
H: Noise IHF-A (−40 dB)
I: Peak Level

Functions A to I are combined and described logically such as A + B + C, $\overline{A + B + C}$, etc. The meaning of these signals are:

A + B + C: will be "H" (i.e., will be effective) if function A OR B OR C is selected.
$\overline{A + B + C}$: will be "L" (i.e., will be effective) if function A OR B OR C is selected.

Notes: 1. If the function other than A, B, or C is selected, signals A + B + C and $\overline{A + B + C}$ become open in the Switch P.C.B. circuit, but in the next stage −10 V or +10 V bias is applied to signal A + B + C or $\overline{A + B + C}$. Thus, the "L" or "H" level is obtained.
2. "H" and "L" levels should be as follows:
"H": +6.5 V – +10 V
"L": −10 V – −7.5V

Fig. 1.14 shows the actual circuit.
Common terminal of the Function Switch is connected to +10 V or −10 V and terminals A, B and C become inputs of DIODE OR Gate.

1.5. Semiconductor Switch

Circuits are controlled by the semiconductor switch of FET and transistor. Below shown is the table for the semiconductor switch and equivalent mechanical switch.

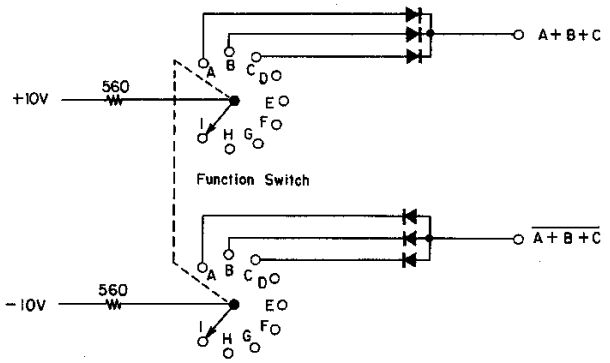

Fig. 1.14

Table 1.1

	Circuit	Control Input	Mechanical Switch
FET	Input — Output; Control Input	High (+10V)	ON
		Low (−10V)	OFF
Transistor	Input; Control Input	High (+10V)	ON
		Low (−10V)	OFF

2. REMOVAL PROCEDURES

2.1. Top Cover Ass'y, Bottom Cover Ass'y and Synthesis Mechanism Ass'y with Power Supply Ass'y

Refer to Fig. 2.1.

(1) Remove F01, F02 and F03, then disassemble F04 (Top Cover Ass'y) and F05 (Acrylic Cover).

(2) Remove F06 and F07, then disassemble F08 (Bottom Cover Ass'y) and F09 (Synthesis Mechanism Ass'y with Power Supply Ass'y).

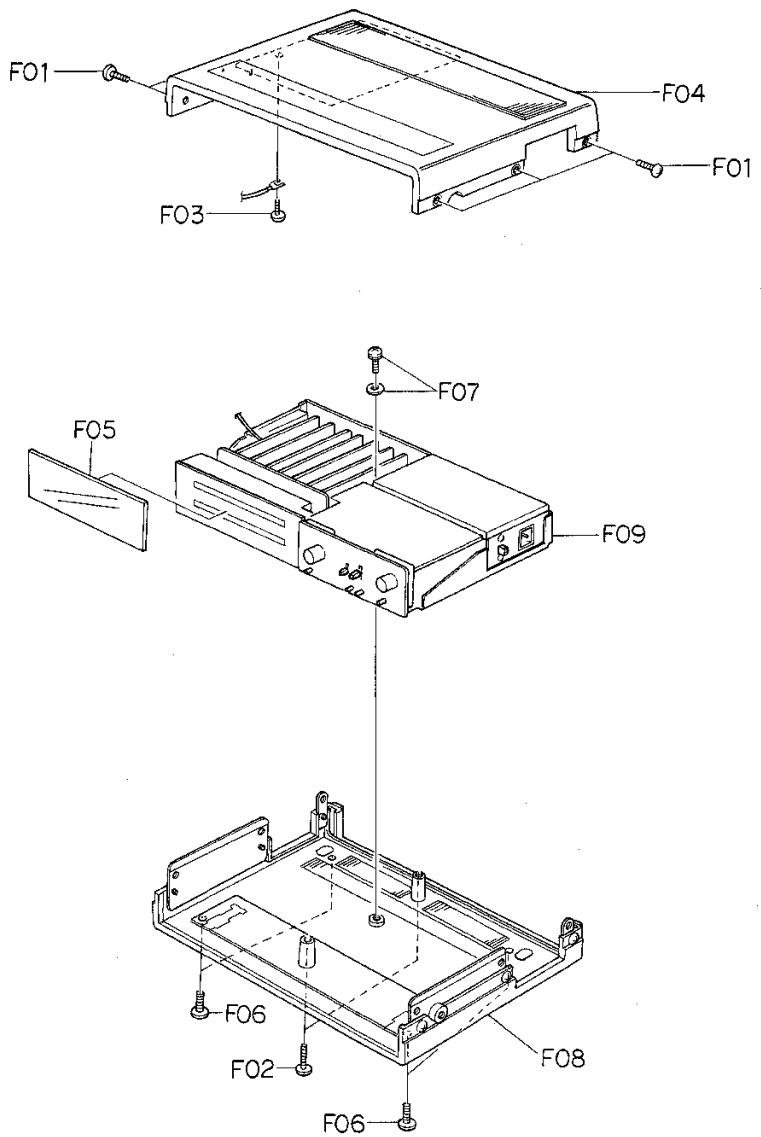

Fig. 2.1

2.2. Power Supply Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to item 2.1.
(2) Remove F01, then disassemble F02 (Power Supply Box Cover).
(3) Remove F03, F04 and F05, then disassemble F06 (Power Supply Ass'y).

2.3. Connector P.C.B. Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to item 2.1.
(2) Remove F05 and F07, then disassemble F08 (Rear Panel B Ass'y).
(3) Remove F09, then disassemble F10 (Connector P.C.B. Ass'y).

2.4. Switch Control Ass'y and Bar-graph Holder Ass'y

Refer to Fig. 2.2.

(1) Refer to Fig. 2.1. Remove Top Cover Ass'y and Bottom Cover Ass'y referring to item 2.1.
(2) Remove F11, then disassemble F12 (Switch Control Ass'y).
(3) Remove F13, then disassemble F14 (Bar-graph Holder Ass'y).

2.5. 6P Pin Jack Ass'y

Refer to Fig. 2.2.

(1) Remove F10 (Connector P.C.B. Ass'y) referring to item 2.3.
(2) Remove F15, then disassemble F16 (Shield Plate), F17 (6P Pin Jack Ass'y) and F18 (Pin Jack Name Plate).

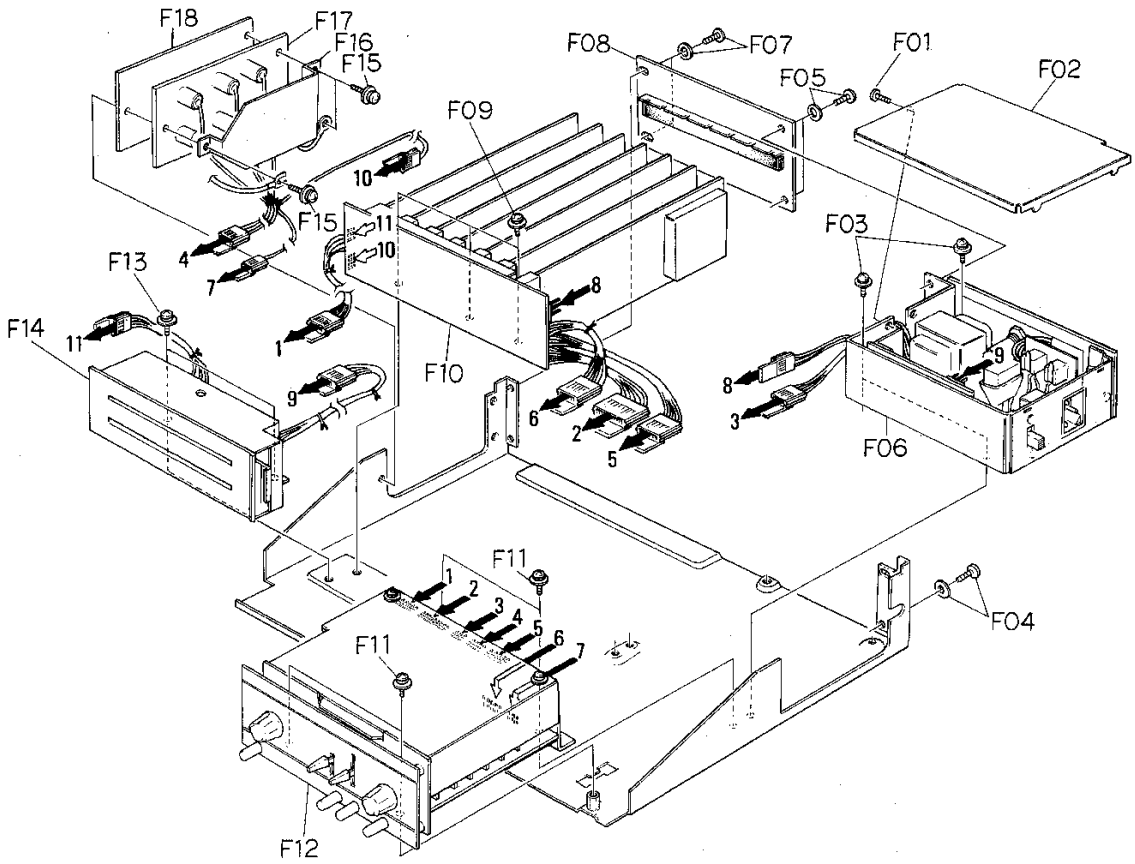

Fig. 2.2

2.6. Switch P.C.B. Ass'y and Volume P.C.B. Ass'y

Refer to Fig. 2.3.

(1) Refer to Fig. 2.2. Remove Switch Control Ass'y referring to item 2.4.
(2) Remove F01, then disassemble F02 (Rotary Switch Knob Ass'y).
(3) Pull out F03 (Slide Switch Knob) and F04 (Calibration Knob).
(4) Remove F05, then disassemble F06 (Front Panel Ass'y) and F07 (Front Panel Stud).
(5) Remove F08, then disassemble F09 (Switch P.C.B. Insulator), F10 (Wire Holder 583) and F11 (Switch P.C.B. Holder Ass'y).
(6) Remove F12 and F13, then disassemble F14 (Switch P.C.B. Ass'y).
(7) Remove F15, then disassemble F16 (Volume P.C.B. Ass'y) and F17 (Switch Holder).

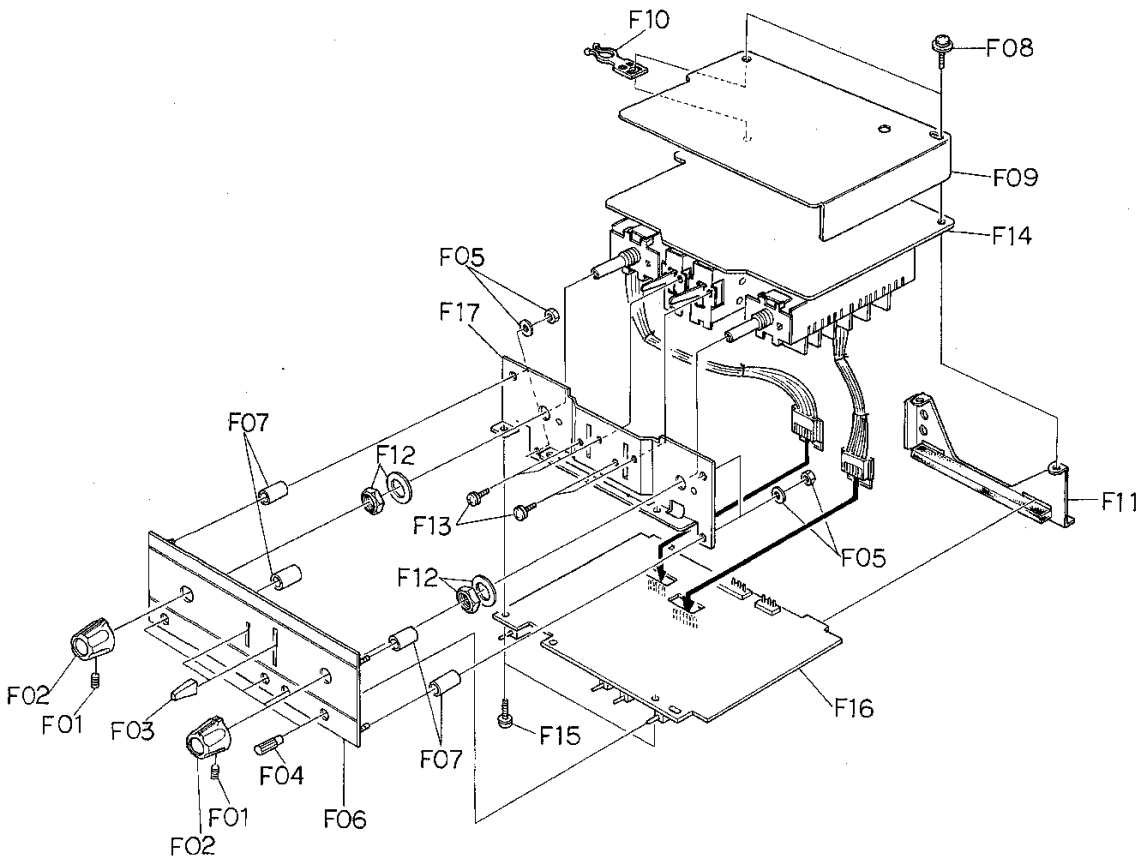

Fig. 2.3

2.7. Display P.C.B. Ass'y and Bar-graph

Refer to Fig. 2.4.

(1) Refer to Fig. 2.2. Remove Bar-graph Holder Ass'y referring to item 2.4.

(2) Remove F01, then disassemble F02 (Shield Cover Ass'y)

(3) Remove F03, then disassemble F04 (Display P.C.B. Ass'y) and F05 (Display P.C.B. Insulator).

(4) Remove F06, then disassemble F07 (Scale Panel Ass'y).

(5) Remove F08, then disassemble F09 (8P Plug P.C.B. Ass'y).

(6) Remove F10 and F11 (Pressure Plate Ass'y), then disassemble F12 (Bar-graph) and F13 (Bar-graph Holder Ass'y).

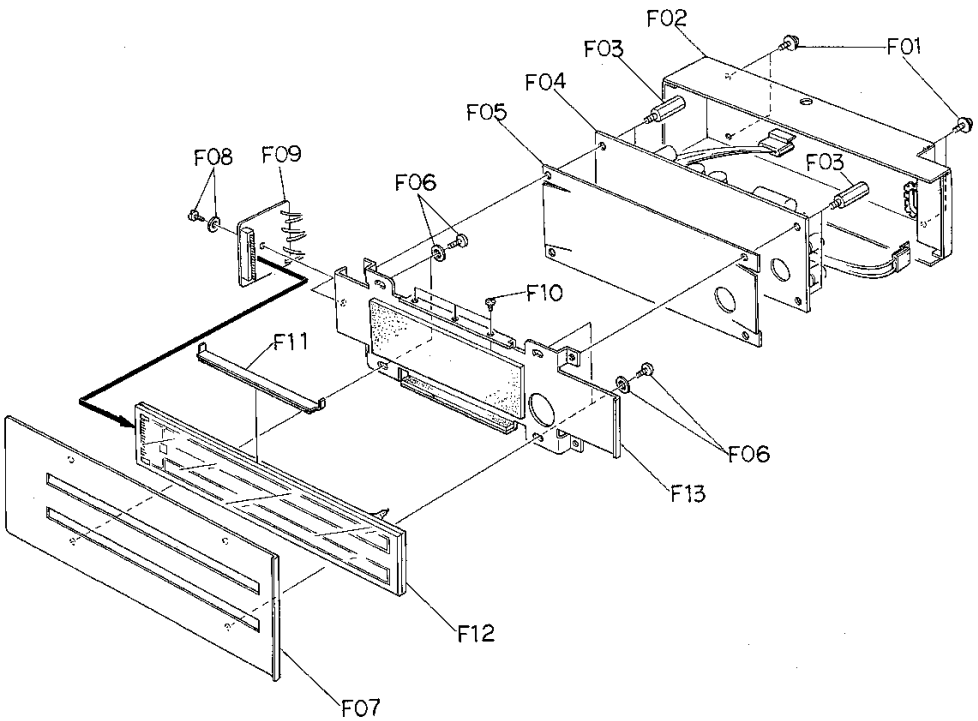

Fig. 2.4

2.8. Power Supply P.C.B. Ass'y and Power Transformer
Refer to Fig. 2.5.
(1) Refer to Fig. 2.2. Remove Power Supply Ass'y referring to item 2.2.
(2) Remove F01, then disassemble F02 (Power Supply P.C.B. Ass'y).
(3) Remove F03 and F04, then disassemble F05 (Power Transformer).

2.9. Rear Panel A Ass'y, Power Switch and AC Inlet
Refer to Fig. 2.5.
(1) Refer to Fig. 2.2. Remove Power Supply Ass'y referring to item 2.2.
(2) Remove F06 and F07, then disassemble F08 (Rear Panel A Ass'y).
(3) Remove F09 and F10, then disassemble F11 (Power Switch).
(4) Remove F12 and F13, then disassemble F14 (Power Supply Name Plate).
(5) Remove F15 and F16 (Inlet Holder), then disassemble F17 (AC Inlet).

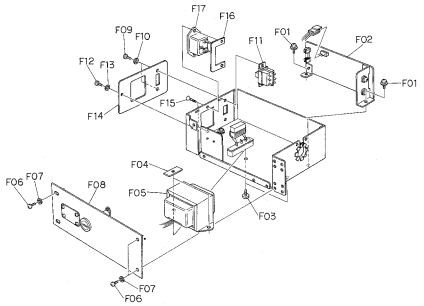

Fig. 2.5

3. MEASUREMENT INSTRUMENTS

(1)	Oscillator 20 Hz – 20 kHz	
	Level Deviation:	±0.1 dB or less
	Distortion:	0.1% or less
	Output Voltage:	3.16 V or more
(2)	VTVM	
(3)	DC Voltmeter	
	Input Impedance:	100 k-ohm or more
	Accuracy:	1% or less
	Resolving Ability:	0.1 mV or less
(4)	Distortion Meter	
	Minimum Range:	0.01% or less (at full-scale)
	Frequency:	400 Hz
(5)	Oscilloscope	
(6)	Standard Distortion Generator	
	Fundamental Frequency:	400 Hz
	Distortion Rate:	0.1%, 0.3%, 1%, 3%
	Output Voltage:	3.16 V or more
(7)	Standard Wow and Flutter Generator	
	Center Frequency:	3,000 Hz
	Wow Frequency:	4 Hz
	Wow:	1% (peak)
	Output Voltage:	100 mV or more
(8)	Frequency Counter	

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4. PARTS LOCATION FOR ELECTRICAL ADJUSTMENT

4.1. Current Type

Note: In the current type, VR701 and VR801 on the Absolute Rectifier P.C.B. Ass'y are removed.

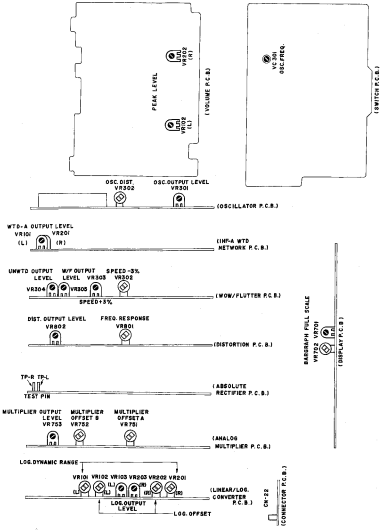

Fig. 4.1

4.2. Previous Type

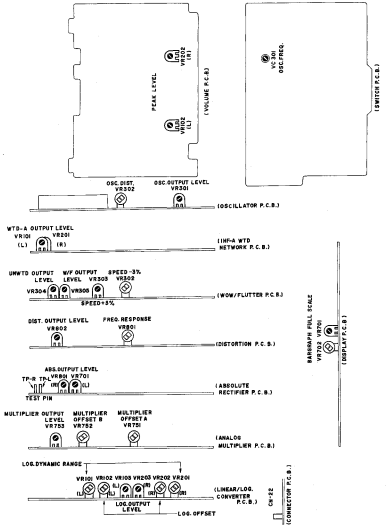

Fig. 4.2

NAKA-00088 / DRUCK 2

5. ADJUSTMENT AND MEASUREMENT INSTRUCTIONS

5.1. Current Type

Note: In the current type, absolute output level adjustment is removed.

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Oscillator Frequency		Frequency Counter to Oscillator OUTPUT Jacks	Function — Level Oscillator — 400 Hz Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Switch P.C.B. VC301	Adjust VC301 to obtain 400 Hz on the Frequency Counter.
2	Oscillator Distortion		Distortion Meter to Oscillator OUTPUT Jack	Function — T.H. Dist. Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Osc. P.C.B. VR302	Adjust VR302 to obtain 0.06% — 0.07% distortion. Note: Connect an Oscilloscope to the Output of the Distortion Meter and check to insure that no humming noise is included in the signal.
3	Oscillator Output Level		VTVM to Oscillator OUTPUT Jacks	Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Osc. P.C.B. VR301	Adjust VR301 to obtain 1.2 V on the VTVM.
4	Log. Output Level	Oscillator to INPUT Jacks	DC Voltmeter to CN22-1, CN22-2	Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Linear/Log. Converter P.C.B. VR103, VR203	Feed in 1 kHz 1 V and adjust VR103 (VR203) to obtain 2.18 V on the DC Voltmeter.
5	Bargraph Full Scale	Oscillator to INPUT Jacks		Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Display P.C.B. VR701	Feed in 1 kHz 1 V and adjust VR701 so that the Bargraph indicates 0 dB. Note: Adjust VR702 only if circuit is repaired.

Fig. 5.1.1.
1. Oscillator Frequency

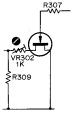

Fig. 5.1.2
2. Oscillator Distortion

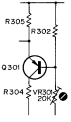

Fig. 5.1.3
3. Oscillator Output Level

Fig. 5.1.4
4. Log. Output Level

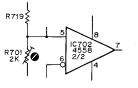

Fig. 5.1.5
5. Bargraph Full Scale

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STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
6	Log. Output Level Log. Dynamic Range Log. Offset	Oscillator to INPUT Jacks		Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Linear/Log. Converter P.C.B. VR103, VR203 VR102, VR202 VR101, VR201	Feed in 1 kHz +10 dB (3.16 V), 0 dB (1 V), -10 dB (316 mV), or -20 dB (100 mV) and check whether the Bargraph indicates +10 dB, 0 dB, -10 dB, or -20 dB. (Allowance of error is within ±1 segment on the Bargraph.) If above is not obtained perform the following steps: 1. Feed in +10 dB (3.16 V), and adjust VR103 for the left channel and VR203 for the right channel to obtain +10 dB on the Bargraph. 2. Feed in -10 dB (316 mV) and adjust VR102 for the left channel and VR202 for the right channel to obtain -10 dB on the Bargraph. 3. Feed in -20 dB (100 mV) and adjust VR101 for the left channel and VR201 for the right channel to obtain -20 dB on the Bargraph. 4. Repeat above steps 1 — 3 until the error between input level and indicated value on the Bargraph becomes within ±1 segment on the Bargraph in each input level.
7	Peak Level	Oscillator to INPUT Jacks		Function — Noise-A (—40 dB) Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Volume P.C.B. VR102, VR202	Feed in 1 kHz 0 dB (1 V) and adjust VR102 (VR202) to obtain 0 dB on the Bargraph.
8	WTD-A Output Level	Oscillator to INPUT Jacks		Function — Level Meter Range — 1% Input Level — 10 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	IHF-A WTD Network P.C.B. VR101, VR201	Feed in 1 kHz -20 dB (100 mV) and adjust VR101 (VR201) to obtain 0 dB on the Bargraph.
9	Speed	Oscillator and Frequency Counter to INPUT Jacks		Function — Wow/Flutter Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Wow/Flutter P.C.B. VR302, VR303	1. Feed in 2,910 Hz ±1 Hz 1 V and adjust VR302 to obtain -3% speed on the Bargraph. 2. Feed in 3,090 Hz ±1 Hz 1 V and adjust VR303 to obtain +3% speed on the Bargraph.
10	UNWTD Output Level	Standard Wow/Flutter Generator to INPUT Jacks		Function — Unweighted Meter Range — 1% Input Level — 1V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Wow/Flutter P.C.B. VR304	1. Set the Standard Wow/Flutter Generator to the following modes: Center Frequency — 3 kHz Wow Frequency — 4 Hz Wow/Flutter — 1% (peak) Output Level — 0.5 to 2 V 2. Adjust VR304 to obtain 1% wow/flutter on the Bargraph.

Note: Turn the Speed Calibration Control fully counterclockwise, then turn it clockwise approximately 7-1/2 times to set the Control to the center position.

Fig. 5.1.6
6. Log. Adjustment

Fig. 5.1.7
6. Log. Adjustment

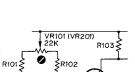

Fig. 5.1.8
6. Log. Adjustment

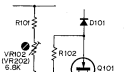

Fig. 5.1.9
7. Peak Level

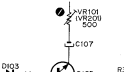

Fig. 5.1.10
8. WTD-A Output Level

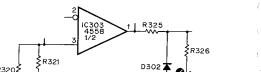

Fig. 5.1.11
9. Speed

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
11	Wow/Flutter Output Level	Standard Wow/Flutter Generator to INPUT Jacks		Function — Wow/Flutter Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Wow/Flutter P.C.B. VR305	1. Set the Standard Wow/Flutter Generator to the following modes: Center Frequency — 3 kHz Wow Frequency — 4 Hz Wow/Flutter — 1% (peak) Output Level — 0.5 to 2 V 2. Adjust VR305 to obtain 1% wow/flutter on the Bargraph.
12	Frequency Response Distortion Output Level	Oscillator and Frequency Counter to INPUT Jacks	VTVM to SCOPE OUTPUT Jack	Function — T.H. Dist. Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Distortion P.C.B. VR801, VR802	1. Feed in 2.5 kHz ±10 Hz 100 mV and read the level on the VTVM. 2. Feed in 760 Hz ±10 Hz 100 mV and adjust VR801 to obtain the same level as above step 1. 3. Repeat above steps 1 and 2 until the difference of the levels between steps 1 and 2 becomes 0. 4. Feed in 2.5 kHz ±10 Hz 100 mV and adjust VR802 to obtain 2.87 V on the VTVM.
13	Multiplier Output Level	Standard Distortion Generator to INPUT Jacks		Function — T.H. Dist. Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Analog Multiplier P.C.B. VR753, VR751, VR752	1. Set the output of the Distortion Generator to 400 Hz +10 dB (3.16 V) 1% distortion. 2. Adjust VR753 to obtain 1% T.H. Distortion on the Bargraph. 3. Set the output of the Distortion Generator to 0 dB (1 V) or -10 dB (316 mV) and check to insure that the Bargraph indicates 0 dB or -10 dB with a tolerance of ± 1 segment. 4. Set the output of the Distortion Generator to 400 Hz +10 dB (3.16 V), 0 dB (1 V), or -10 dB (316 mV) in 3%, 0.3%, or 0.1% distortion. Then check to insure that the tolerance of the Bargraph against the input level is within the following specified range: Tolerance: 0.3%, 1%, 3% . . . . . ±1 segment 0.1% . . . . . ±2 segments 5. If above does not comply with the specified one, following adjustments are required: a. Set the distortion of the Distortion Generator to 3%. Adjust VR751 so that the indicated distortion on the Bargraph stays the same when the output of the Distortion Generator is changed from +10 dB (3.16 V) to -10 dB (316 mV). b. Set the distortion of the Distortion Generator to 1% and adjust VR751 in the same manner as above step a. c. Set the distortion of the Distortion Generator to 0.3% and adjust VR752 in the same manner as above step a. d. Set the distortion of the Distortion Generator to 0.1% and adjust VR752 in the same manner as above step a. e. Repeat above steps a — d until specified tolerance is obtained. f. After the above steps are completed, set the output of the Distortion Generator to 400 Hz +10 dB (3.16 V) 1% distortion and adjust VR753 to obtain 1% distortion on the Bargraph.

Note: Turn the Speed Calibration Control fully counterclockwise, then turn it clockwise approximately 7-1/2 times to set the Control to the center position.

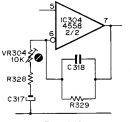

Fig. 5.1.12
10. UNWTD Output Level

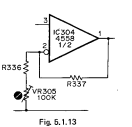

Fig. 5.1.13
11. Wow/Flutter Output Level

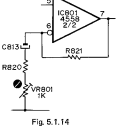

Fig. 5.1.14
12. Frequency Response and Distortion Output Level

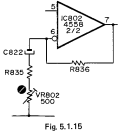

Fig. 5.1.15

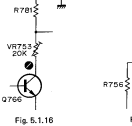

Fig. 5.1.16
13. Multiplier Output Level

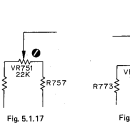

Fig. 5.1.17
13. Multiplier Output Level

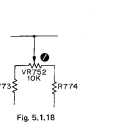

Fig. 5.1.18
13. Multiplier Output Level

5.2. Previous Type

STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
1	Oscillator Frequency		Frequency Counter to Oscillator OUTPUT Jacks	Function — Level Oscillator — 400 Hz Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Switch P.C.B. VC301	Adjust VC301 to obtain 400 Hz on the Frequency Counter.
2	Oscillator Distortion		Distortion Meter to Oscillator OUTPUT Jack	Function — T.H. Dist. Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Osc. P.C.B. VR302	Adjust VR302 to obtain 0.06% — 0.07% distortion. Note: Connect an Oscilloscope to the Output of the Distortion Meter and check to insure that no humming noise is included in the signal.
3	Oscillator Output Level		VTVM to Oscillator OUTPUT Jacks	Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Osc. P.C.B. VR301	Adjust VR301 to obtain 1.2 V on the VTVM.
4	Absolute Output Level	Oscillator to INPUT Jacks	DC Voltmeter to TP-L, TP-R (Absolute Rectifier P.C.B.)	Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Absolute Rectifier P.C.B. VR701, VR801	Feed in 1 kHz 1 V and adjust VR701 (VR801) to obtain -1.5 V on the DC Voltmeter. Note: Input level should be measured with connecting T-100.
5	Log. Output Level	Oscillator to INPUT Jacks	DC Voltmeter to CN22-1, CN22-2	Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Linner/Log. Converter P.C.B. VR103, VR203	Feed in 1 kHz 1 V and adjust VR103 (VR203) to obtain 2.18 V on the DC Voltmeter.
6	Bargraph Full Scale	Oscillator to INPUT Jacks		Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Display P.C.B. VR701	Feed in 1 kHz 1 V and adjust VR701 so that the Bargraph indicates 0 dB. Note: Adjust VR702 only if circuit is repaired.

Fig. 5.2.1
1. Oscillator Frequency

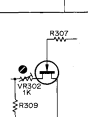

Fig. 5.2.2
2. Oscillator Distortion

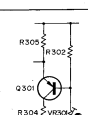

Fig. 5.2.3
3. Oscillator Output Level

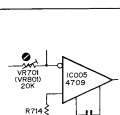

Fig. 5.2.4
4. Absolute Output Level

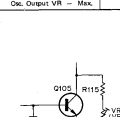

Fig. 5.2.5
5. Log. Output Level

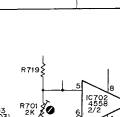

Fig. 5.2.6.
6. Bargraph Full Scale

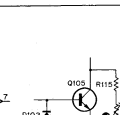

Fig. 5.2.7
7. Log. Adjustment

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STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
7	Log. Output Level Log. Dynamic Range Log. Offset	Oscillator to INPUT Jacks		Function — Level Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Linear/Log. Converter P.C.B. VR103, VR203 VR102, VR202 VR101, VR201	Feed in 1 kHz +10 dB (3.16 V), 0 dB (1 V), −10 dB (316 mV), or −20 dB (100 mV) and check whether the Bargraph indicates +10 dB, 0 dB, −10 dB, or −20 dB. (Allowance of error is within ±1 segment on the Bargraph.) If above is not obtained perform the following steps: 1. Feed in +10 dB (3.16 V), and adjust VR103 for the left channel and VR203 for the right channel to obtain +10 dB on the Bargraph. 2. Feed in −10 dB (316 mV) and adjust VR102 for the left channel and VR202 for the right channel to obtain −10 dB on the Bargraph. 3. Feed in −20 dB (100 mV) and adjust VR101 for the left channel and VR201 for the right channel to obtain −20 dB on the Bargraph. 4. Repeat above steps 1 — 3 until the error between input level and indicated value on the Bargraph becomes within ±1 segment on the Bargraph in each input level.
8	Peak Level	Oscillator to INPUT Jacks		Function — Noise-A (−40 dB) Meter Range — 1% Input Level — 1 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	Volume P.C.B. VR102, VR202	Feed in 1 kHz 0 dB (1 V) and adjust VR102 (VR202) to obtain 0 dB on the Bargraph.
9	WTD-A Output Level	Oscillator to INPUT Jacks		Function — Level Meter Range — 1% Input Level — 10 V Speed Cal. VR — Not specified Input Level VR — Max. Osc. Output VR — Max.	WTD (IHF-A) Network P.C.B. VR101, VR201	Feed in 1 kHz −20 dB (100 mV) and adjust VR101 (VR201) to obtain 0 dB on the Bargraph.
10	Speed	Oscillator and Frequency Counter to INPUT Jacks		Function — Wow/Flutter Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Wow/Flutter P.C.B. VR302, VR303	1. Feed in 2,910 Hz ±1 Hz 1 V and adjust VR302 to obtain −3% speed on the Bargraph. 2. Feed in 3,090 Hz ±1 Hz 1 V and adjust VR303 to obtain +3% speed on the Bargraph.
11	UNWTD Output Level	Standard Wow/Flutter Generator to INPUT Jacks		Function — Unweighted Meter Range — 1% Input Level — 1V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Wow/Flutter P.C.B. VR304	1. Set the Standard Wow/Flutter Generator to the following modes: Center Frequency — 3 kHz Wow Frequency — 4 Hz Wow/Flutter — 1% (peak) Output Level — 0.5 to 2 V 2. Adjust VR304 to obtain 1% wow/flutter on the Bargraph.

Note: Turn the Speed Calibration Control fully counterclockwise, then turn it clockwise approximately 7-1/2 times to set the Control to the center position.

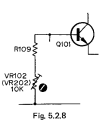

Fig. 5.2.8
7. Log. Adjustment

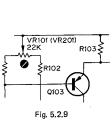

Fig. 5.2.9
7. Log. Adjustment

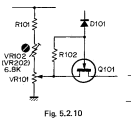

Fig. 5.2.10
8. Peak Level

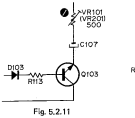

Fig. 5.2.11
9. WTD-A Output Level

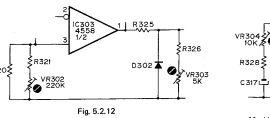

Fig. 5.2.12
10. Speed

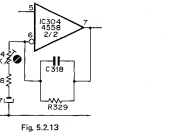

Fig. 5.2.13
11. UNWTD Output Level

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STEP	ITEM	SIGNAL SOURCE	OUTPUT CONNECTION	MODE	ADJUSTMENT	REMARKS
12	Wow/Flutter Output Level	Standard Wow/Flutter Generator to INPUT Jacks		Function — Wow/Flutter Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Wow/Flutter P.C.B. VR305	1. Set the Standard Wow/Flutter Generator to the following modes: Center Frequency — 3 kHz Wow Frequency — 4 Hz Wow/Flutter — 1% (peak) Output Level — 0.5 to 2 V 2. Adjust VR305 to obtain 1% wow/flutter on the Bargraph.
13	Frequency Response Distortion Output Level	Oscillator and Frequency Counter to INPUT Jacks	VTVM to SCOPE OUTPUT Jack	Function — T.H. Dist. Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Distortion P.C.B. VR801, VR802	1. Feed in 2.5 kHz ±10 Hz 100 mV and read the level on the VTVM. 2. Feed in 760 Hz ±10 Hz 100 mV and adjust VR801 to obtain the same level as above step 1. 3. Repeat above steps 1 and 2 until the difference of the levels between steps 1 and 2 becomes 0. 4. Feed in 2.5 kHz ±10 Hz 100 mV and adjust VR802 to obtain 2.87 V on the VTVM.
14	Multiplier Output Level	Standard Distortion Generator to INPUT Jacks		Function — T.H. Dist. Meter Range — 1% Input Level — 1 V Speed Cal. VR — Center (See note) Input Level VR — Max. Osc. Output VR — Max.	Analog Multiplier P.C.B. VR752, VR751, VR752	1. Set the output of the Distortion Generator to 400 Hz +10 dB (3.16 V) 1% distortion. 2. Adjust VR753 to obtain 1% T.H. Distortion on the Bargraph. 3. Set the output of the Distortion Generator to 0 dB (1 V) or -10 dB (316 mV) and check to insure that the Bargraph indicates 0 dB or -10 dB with a tolerance of ±1 segment. 4. Set the output of the Distortion Generator to 400 Hz +10 dB (3.16 V), 0 dB (1 V), or -10 dB (316 mV) in 3%, 0.3%, or 0.1% distortion. Then check to insure that the tolerance of the Bargraph against the input level is within the following specified range: Tolerance: 0.3%, 1%, 3% . . . . . ±1 segment 0.1% . . . . . ±2 segments 5. If above does not comply with the specified one, following adjustments are required: a. Set the distortion of the Distortion Generator to 3%. Adjust VR751 so that the indicated distortion on the Bargraph stays the same when the output of the Distortion Generator is changed from +10 dB (3.16 V) to -10 dB (316 mV). b. Set the distortion of the Distortion Generator to 1% and adjust VR751 in the same manner as above step a. c. Set the distortion of the Distortion Generator to 0.3% and adjust VR752 in the same manner as above step a. d. Set the distortion of the Distortion Generator to 0.1% and adjust VR752 in the same manner as above step a. e. Repeat above steps a – d until specified tolerance is obtained. f. After the above steps are completed, set the output of the Distortion Generator to 400 Hz +10 dB (3.16 V) 1% distortion and adjust VR753 to obtain 1% distortion on the Bargraph.

Note: Turn the Speed Calibration Control fully counterclockwise, then turn it clockwise approximately 7-1/2 times to set the Control to the center position.

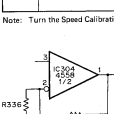


Fig. 5.2.14
12. Wow/Flutter Output Level

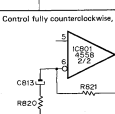


Fig. 5.2.15
13. Frequency Response and Distortion Output Level

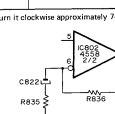


Fig. 5.2.16

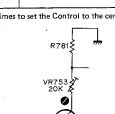


Fig. 5.2.17
14. Multiplier Output Level

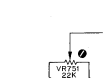


Fig. 5.2.18
14. Multiplier Output Level

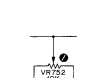


Fig. 5.2.19
14. Multiplier Output Level

NAKA-00068 / DRUCK 8

6. MOUNTING DIAGRAMS, CIRCUIT DIAGRAMS AND PARTS LIST

Note: Mounting diagram shows a dip side view of the printed circuit board.

6.1. IC Block Diagrams

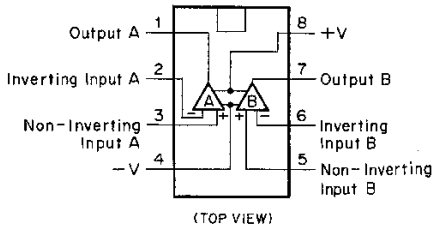


Fig. 6.1.1 OP Amp. IC 4558

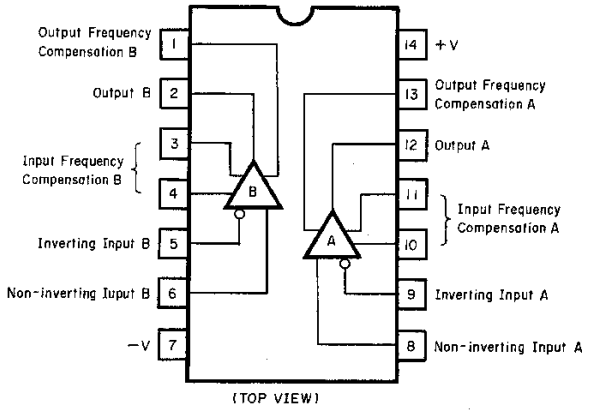


Fig. 6.1.2 OP Amp. IC 4709

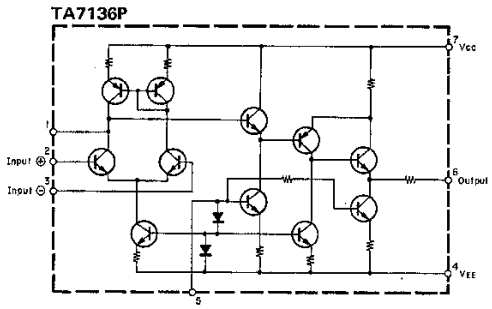


Fig. 6.1.3 OP Amp. IC TA7136P

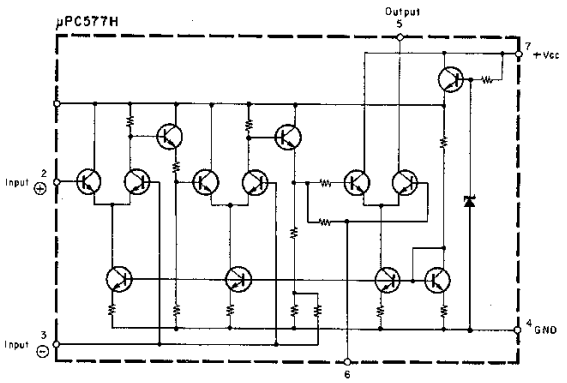


Fig. 6.1.4 FM IF Amp. IC μPC577H

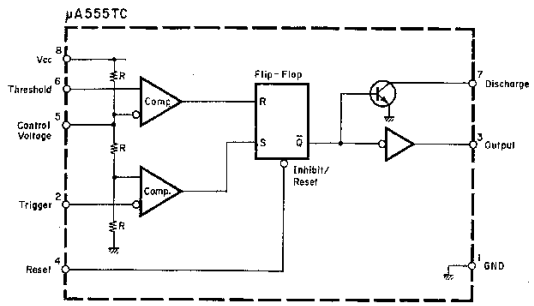


Fig. 6.1.5 Timer IC μA555TC

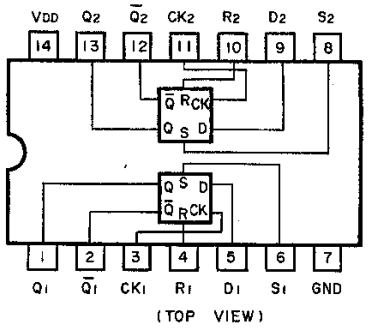


Fig. 6.1.6 D-Type Flip-Flop C-MOS IC TC4013BP

6.2. Connector P.C.B. Ass'y

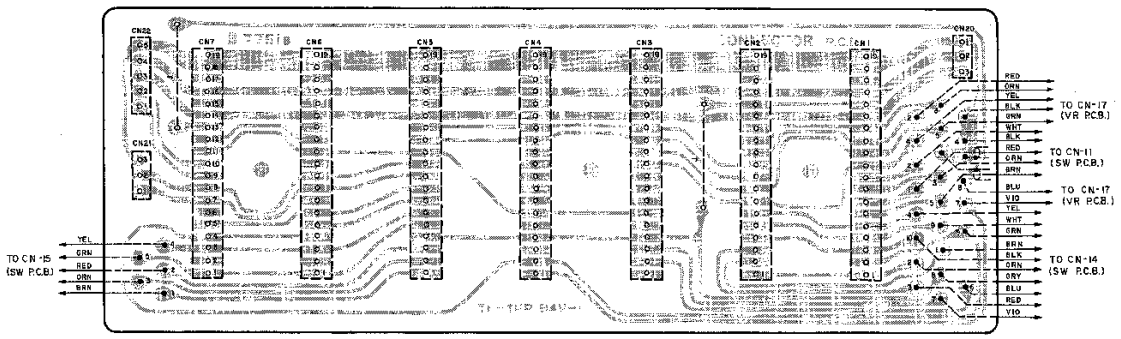


Fig. 6.2.1

Schematic Ref. No.	Part No.	Description	
	BA03893A	**Connector P.C.B. Ass'y**	
	0B07751B	Connector P.C.B.	
	BA03808A	19P Connector Ass'y	(7 pcs.)
	0B08435A	CN Connector A	(1 pce.)
	0B08436A	CN Connector B	(1 pce.)
	0B08437B	CN Connector C	(1 pce.)
	0B08438A	CN Connector D	(1 pce.)
	0B08185A	3P-T Post	(2 pcs.)
	0B08183A	5P-T Post	(1 pce.)

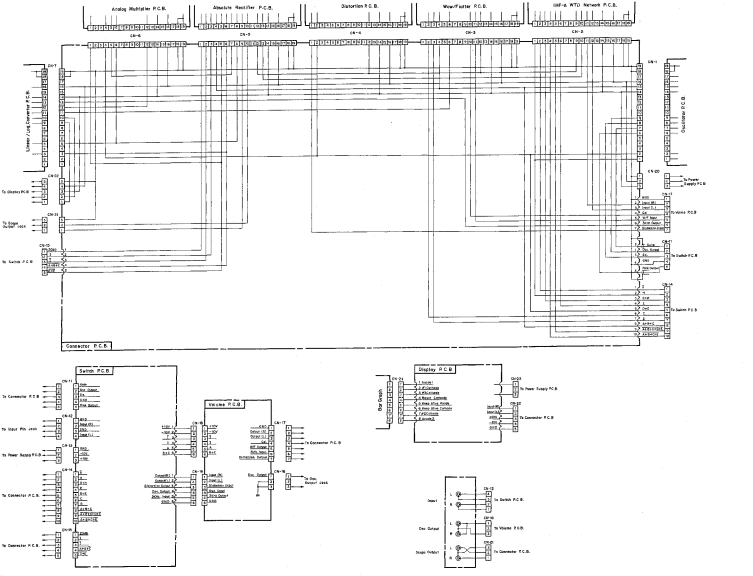


Fig. 6.2.2 Connecting Diagram

6.3. Power Supply P.C.B. Ass'y

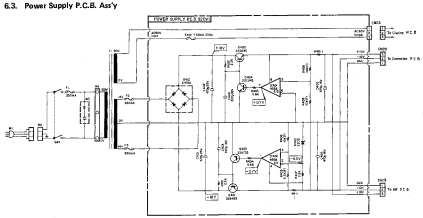


Fig. 6.3.1 120 V

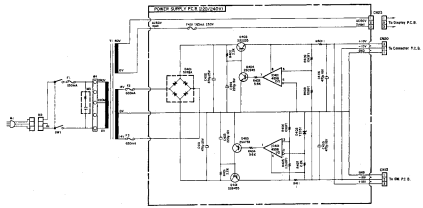


Fig. 6.3.3 220 V/240 V

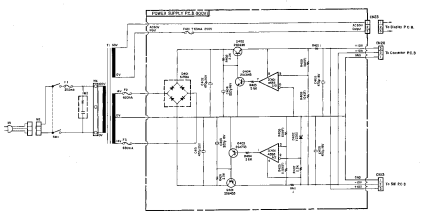


Fig. 6.3.2 100 V

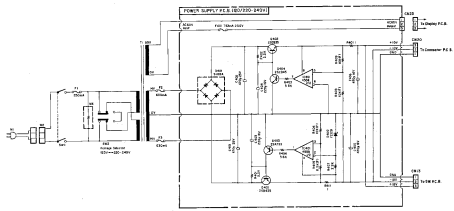


Fig. 6.3.4 120 V/120-240 V

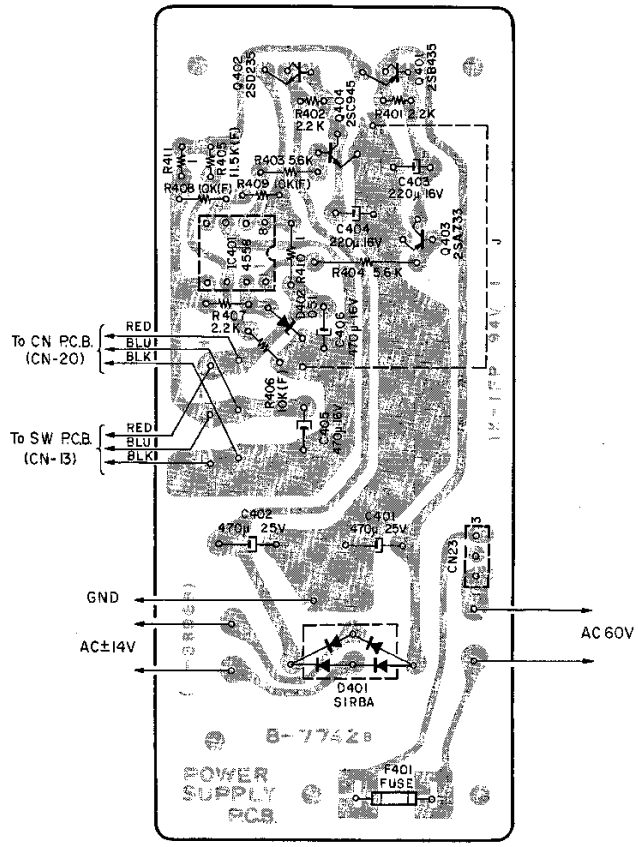


Fig. 6.3.5

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description	
	BA03892A	**Power Supply P.C.B. Ass'y**		CN23	0B08185A	3P-T Post	
					0B08345A	Fuse T 63mA	250V (1 pce.)
	0B07742B	Power Supply P.C.B.			0B08349A	Fuse Clip	(2 pcs.)
IC401	0B06124B	IC	RC4558D		0B08430A	P-S Connector A 3PH	(1 pce.)
Q401	0B06011A	Transistor	2SB435		0B08431A	P-S Connector B 3PH	(1 pce.)
Q402	0B01823A	Transistor	2SD235		0B08077B	Motor Governor P.C.B. Holder	(1 pce.)
Q403	0B06013A	Transistor	2SA733		0J03740B	Heat Sink E1	(1 pce.)
Q404	0B06100A	Transistor	2SC945 (A)		0E00606A	Screw M3x6 Philips Pan Head (3A)	(3 pcs.)
D401	0B06088A	Diode Bridge	1SRBA 1A 100V				
D402	0B06058A	Zener Diode	YZ051		0E00608A	Screw M3x10 Philips Pan Head (3A)	(2 pcs.)
R401,402 407	0B05566A	Carbon Resistor	2.2K ERD-25V J		0E00507A	Nut Hex. M3	(2 pcs.)
R403,404	0B01887A	Carbon Resistor	5.6K ERD-25T J		0B05206A	Glass Tube 12mm	(4 pcs.)
R405	0B09071A	Metal Film Resistor	11.5K ERO-25CK F		0M03773A	Fuse Label T 63mA	(1 pce.)
R406,408 409	0B09014A	Metal Film Resistor	10K ERO-25CK F				
R410,411	0B05941A	Fail Safe Type Resistor 1	ERD-14F J				
C401,402	0B01401A	Electrolytic Capacitor 470μ	25V				
C403,404	0B01398A	Electrolytic Capacitor 220μ	16V				
C405,406	0B01392A	Electrolytic Capacitor 470μ	16V				

6.4. Wow & Flutter P.C.B. Ass'y

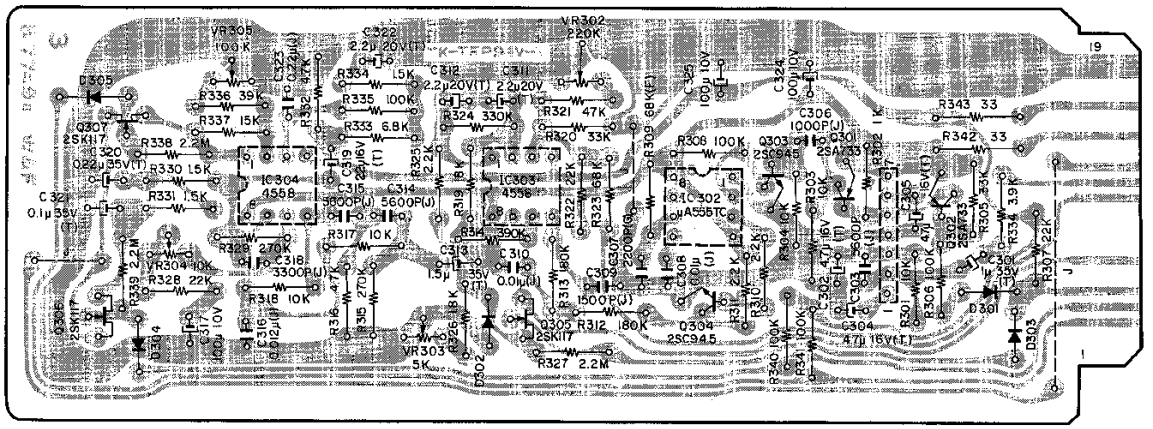
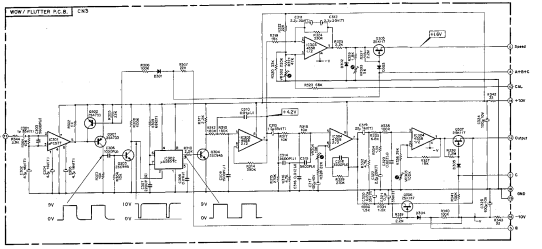


Fig. 6.4.1

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description	
	BA03884A	**Wow & Flutter P.C.B. Ass'y**		R326	0B05614A	Carbon Resistor	1.8K ERD-25T J
				R327,338	0B05641A	Carbon Resistor	2.2M ERD-25T J
	0B07749B	Wow & Flutter P.C.B.		339			
IC301	0B06114A	IC	μPC577H	R330,331	0B05698A	Carbon Resistor	1.5K ERD-25T J
IC302	0B06137A	IC	μA555TC	334			
IC303,304	0B06124B	IC	RC4558D	R333	0B01682A	Carbon Resistor	6.8K ERD-25T J
Q301,302	0B06013A	Transistor	2SA733	R336	0B01854A	Carbon Resistor	39K ERD-25T J
Q303,304	0B06100A	Transistor	2SC945 (A)	R337	0B01683A	Carbon Resistor	15K ERD-25T J
Q305,306	0B06129A	FET	2SK117	R342,343	0B01713A	Carbon Resistor	33 ERD-25T J
307				R344	0B05675A	Carbon Resistor	3.9K ERD-25T J
D301-305	0B01909A	Silicon Diode	1S1555 (5 pcs.)	C301	0B05638A	Tantalum Capacitor	1μ 35V
VR302	0B07188A	Semi-fixed Volume	220K (B)	C302,304	0B05657A	Tantalum Capacitor	4.7μ 16V
VR303	0B09059A	Semi-fixed Volume	5K (B)	305			
VR304	0B07162A	Semi-fixed Volume	10K (B)	C303,314	0B05659A	Mylar Capacitor	5600P 50V J
VR305	0B09060A	Semi-fixed Volume	100K (B)	315			
R301,303	0B01888A	Carbon Resistor	10K ERD-25T J	C306	0B05550A	Mylar Capacitor	1000P 50V J
304,317				C307	0B09035A	SP Capacitor	2200P 50V G
318				C308,310	0B05681A	Mylar Capacitor	0.01μ 50V J
R302	0B01857A	Carbon Resistor	1K ERD-25T J	C309	0B05653A	Mylar Capacitor	1500P 50V J
R305,320	0B05509A	Carbon Resistor	33K ERD-25T J	C311,312	0B05598A	Tantalum Capacitor	2.2μ 20V
R306,308	0B01889A	Carbon Resistor	100K ERD-25T J	322			
335,340				C313	0B05639A	Tantalum Capacitor	1.5μ 35V
341				C316	0B05843A	Mylar Capacitor	0.012μ 50V J
R307,322	0B05615A	Carbon Resistor	22K ERD-25T J	C317,324	0B05885A	Electrolytic Capacitor	100μ 10V
328				325			
R309	0B09013A	Metal Film Resistor	68K ERO-25CK F	C318	0B01914A	Mylar Capacitor	3300P 50V J
R310,311	0B05622A	Carbon Resistor	2.2K ERD-25T J	C319	0B05636A	Tantalum Capacitor	22μ 16V
325				C320	0B05772A	Tantalum Capacitor	0.22μ 35V
R312,313	0B05640A	Carbon Resistor	180K ERD-25T J	C321	0B05781A	Tantalum Capacitor	0.1μ 35V
R314	0B05676A	Carbon Resistor	390K ERD-25T J	C323	0B05582A	Mylar Capacitor	0.022μ 50V J
R315,329	0B05620A	Carbon Resistor	270K ERD-25T J		0B05202A	Glass Tube 25mm	(2 pcs.)
R316,332	0B01846A	Carbon Resistor	4.7K ERD-25T J				
R319	0B05560A	Carbon Resistor	18K ERD-25T J				
R321	0B05641A	Carbon Resistor	47K ERD-25T J				
R323	0B05692A	Carbon Resistor	68K ERD-25T J				
R324	0B05627A	Carbon Resistor	330K ERD-25T J				



Conditions:
Input Signal – 3000 Hz (±0.1%), 30 mV or more
Input Range SW – 0 dB
Function Control – Speed Unweighted

Fig. 6.4.2

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

6.5. Switch P.C.B. Ass'y

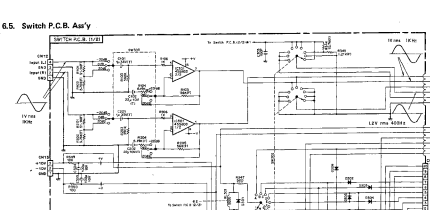

SWITCH P.C.B. (1/2)
To Switch P.C.B. (2/2)
To Volume P.C.B.
To Jack P.C.B.
To Power Amp P.C.B.
LEV 1Vrms 400Hz
Functions
A : Speed Ctrl.
B : Speed Unweighted
C : Speed Wow/Flutter (DIN WTD)
D : Level T.H. Dist. 1400Hz) L
E : Level T.H. Dist. 1400Hz) R
F : Level DIN
G : Level -20dB
H : Noise -INF-&(-40dB)
I : Tests Level

Fig. 6.5.1

Switch P.C.B. Ass'y
Conditions:
Input Signal — 1 V rms 1 kHz
Input Range SW — 0 dB
Function Control — Level
Oscillator Control — 400 Hz

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

Oscillator P.C.B. Ass'y
Conditions:
Function Control — Level
Oscillator Control — 400 Hz
Osc. Output Control — Max.

6.6. Oscillator P.C.B. Ass'y

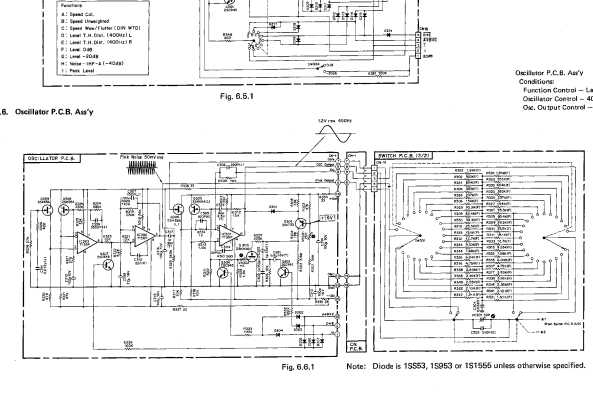


Fig. 6.6.1

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

Schematic Ref. No.	Part No.	Description	
	BA03890A	Switch P.C.B. Ass'y	
	0807340B	Switch P.C.B.	
IC301	0808146A	IC	RC4558DD
Q301	0808100A	Transistor	2SC945 (A)
D301-315	0801909A	Silicon Diode	1S1555 (15 pcs.)
317-319			
321			
R101,201	0805985A	Metal Film Resistor	51.1K ERO-25CK F
R102,202	0805978A	Metal Film Resistor	5.76K ERO-25CK F
R103,203	0805676A	Carbon Resistor	390K ERD-25T J
R104,204	0809011A	Metal Film Resistor	6.19K ERO-25CK F
R105,205	0809012A	Metal Film Resistor	56K ERO-25CK F
R106,206	0801857A	Carbon Resistor	1K ERD-25T J
R301	0805993A	Metal Film Resistor	1.91M ERO-25CK F
R302	0805992A	Metal Film Resistor	953K ERO-25CK F
R303	0805991A	Metal Film Resistor	604K ERO-25CK F
R304	0805990A	Metal Film Resistor	383K ERO-25CK F
R305	0805989A	Metal Film Resistor	237K ERO-25CK F
R306	0805988A	Metal Film Resistor	154K ERO-25CK F
R307	0805987A	Metal Film Resistor	95.3K ERO-25CK F
R308	0805986A	Metal Film Resistor	60.4K ERO-25CK F
R309	0809008A	Metal Film Resistor	38.3K ERO-25CK F
R310	0805984A	Metal Film Resistor	25.5K ERO-25CK F
R311	0805983A	Metal Film Resistor	19.1K ERO-25CK F
R312	0805699A	Metal Film Resistor	12.7K ERO-25CK F
R313	0805981A	Metal Film Resistor	9.53K ERO-25CK F
R314	0805980A	Metal Film Resistor	7.68K ERO-25CK F
R315	0805979A	Metal Film Resistor	6.04K ERO-25CK F
R316	0805977A	Metal Film Resistor	4.75K ERO-25CK F
R317	0805976A	Metal Film Resistor	3.83K ERO-25CK F
R318	0809755A	Metal Film Resistor	3.16K ERO-25CK F
R319	0809005A	Metal Film Resistor	2.55K ERO-25CK F
R320	0809004A	Metal Film Resistor	2.10K ERO-25CK F
R321	0809063A	Metal Film Resistor	1.91K ERO-25CK F
R322	0809030A	Metal Film Resistor	1.91M ERO-25VK F
R323	0809029A	Metal Film Resistor	953K ERO-25VK F
R324	0809028A	Metal Film Resistor	604K ERO-25VK F
R325	0809027A	Metal Film Resistor	383K ERO-25VK F
R326	0809026A	Metal Film Resistor	237K ERO-25VK F
R327	0809025A	Metal Film Resistor	154K ERO-25VK F
R328	0809024A	Metal Film Resistor	95.3K ERO-25VK F
R329	0809023A	Metal Film Resistor	60.4K ERO-25VK F
R330	0809022A	Metal Film Resistor	38.3K ERO-25VK F
R331	0809021A	Metal Film Resistor	25.5K ERO-25VK F
R332	0809020A	Metal Film Resistor	19.1K ERO-25VK F
R333	0809019A	Metal Film Resistor	12.7K ERO-25VK F
R334	0809018A	Metal Film Resistor	9.53K ERO-25VK F
R335	0809017A	Metal Film Resistor	7.68K ERO-25VK F
R336	0809016A	Metal Film Resistor	6.04K ERO-25VK F
R337	0809015A	Metal Film Resistor	4.75K ERO-25VK F
R338	0805999A	Metal Film Resistor	3.83K ERO-25VK F
R339	0809997A	Metal Film Resistor	3.16K ERO-25VK F
R340	0809069A	Metal Film Resistor	2.55K ERO-25VK F
R341	0809068A	Metal Film Resistor	2.10K ERO-25VK F
R342	0809067A	Metal Film Resistor	1.91K ERO-25VK F
R344	0805982A	Metal Film Resistor	10.7K ERO-25CK F
R345	0805971A	Metal Film Resistor	1.21K ERO-25CK F
R346	0801854A	Carbon Resistor	39K ERD-25T J
R347,348	0805575A	Carbon Resistor	560 ERD-25T J
R349,350	0801679A	Carbon Resistor	100 ERD-25T J
R351	0801889A	Carbon Resistor	100K ERD-25T J
VC301	0801290A	Trimmer Capacitor	50P
C101,201	0805635A	Tantalum Capacitor	1µ 35V

Schematic Ref. No.	Part No.	Description	
C102,202	0809044A	Tantalum Capacitor	22μ 10V
C301	0809233A	PP Capacitor	0.033μ 100V F
C302	0809067A	SP Capacitor	510P 50V G
C303	0809882A	Ceramic Capacitor	100P 50V K
C304,305	0809886A	Electrolytic Capacitor	100μ 10V
RL301	0807171A	Relay	24V
SW301	0807196A	Rotary Switch	
SW302	0807197A	Rotary Switch	
SW303	0808400A	Lever Switch	
SW304	0808399A	Lever Switch	
CN11,15	0808303A	5P-S Post	
CN12	0808375A	4P-S Post	
CN13	0808184A	3P-S Post	
CN14	0808286A	10P-S Post	
	0808439A	Switch Connector A	6PH (1 pcs.)
	0808440A	Switch Connector B	6PH (1 pcs.)
	BA03882A	**Oscillator P.C.B. Ass'y**	
	0807743B	Oscillator P.C.B.	
IC301,302 203	0806068A	IC	7136P
Q301	0806013A	Transistor	2SA733
Q302,304 307	0806100A	Transistor	2SC945 (A)
Q303	0806001A	FET	2SK30 (D)
Q305,306	0806198A	FET	2SK68A (L)
Q308,309	0806067A	FET	2SK68A
D301,307	0801908A	Silicon Diode	1S1555 (7 pcs.)
VR301	0806061A	Semi-fixed Volume	20K (B)
VR302	0809083A	Semi-fixed Volume	1K (B)
R301,318	0805608A	Carbon Resistor	56K ERD-25T J
R302,330 331	0805641A	Carbon Resistor	47K ERD-25T J
R303	0805664A	Carbon Resistor	3.9M ERD-25T J
R304,308	0805560A	Carbon Resistor	18K ERD-25T J
R305,313 325	0805509A	Carbon Resistor	33K ERD-25T J
R306,316 317,323	0801888A	Carbon Resistor	10K ERD-25T J
R307,319	0805625A	Carbon Resistor	220K ERD-25T J
R309,315	0805614A	Carbon Resistor	1.8K ERD-25T J
R310	0805575A	Carbon Resistor	560 ERD-25T J
R311,328	0801680A	Carbon Resistor	820 ERD-25T J
R312	0801683A	Carbon Resistor	15K ERD-25T J
R314	0801857A	Carbon Resistor	1K ERD-25T J
R320	0805072A	Carbon Resistor	110K ERD-25T J
R321	0805771A	Carbon Resistor	12K ERD-25T J
R322	0801856A	Carbon Resistor	8.2K ERD-25T J
R324	0805868A	Carbon Resistor	680K ERD-25T J
R326	0805627A	Carbon Resistor	330K ERD-25T J
R327	0805645A	Carbon Resistor	270 ERD-25T J
R329	0805743A	Carbon Resistor	27K ERD-25T J
R332,333 338	0801868A	Carbon Resistor	100K ERD-25T J
R334,335 336,337	0801713A	Carbon Resistor	33 ERD-25T J
R339	0805784A	Carbon Resistor	560K ERD-25T J
C301	0805788A	Tantalum Capacitor	6.8μ 16V
C302	0805683A	Mylar Capacitor	0.033μ 50V J
C303,317	0809828A	Tantalum Capacitor	1μ 35V
C304,312	0805806A	Ceramic Capacitor	22P 50V K
C305	0805892A	Ceramic Capacitor	100P 50V K
C306	0805522A	SP Capacitor	220P 50V J
C307	0809073A	SP Capacitor	150P 50V J

Schematic Ref. No.	Part No.	Description	
C308	0801862A	Electrolytic Capacitor	22μ 16V
C309	0801914A	Mylar Capacitor	3300P 50V J
C310,313 314,315 316	0805888A	Electrolytic Capacitor	100μ 10V
C311	0805843A	Mylar Capacitor	0.012μ 50V
C318	0809119A	Tantalum Capacitor	22μ 6.3V
	0808507A	Oscillator Shield Plate	(1 pcs.)
	0808405A	Oscillator Shield Case E1	(1 pcs.)
	0805202A	Glass Tube 25mm	(4 pcs.)

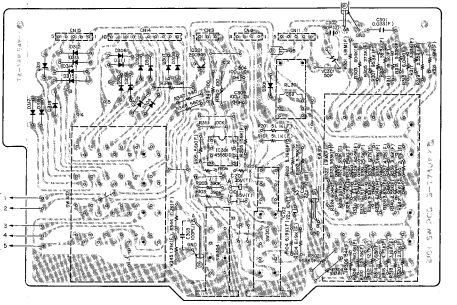


Fig. 6.5.2

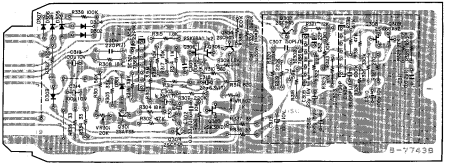


Fig. 6.6.2

6.7. Absolute Rectifier P.C.B. Ass'y

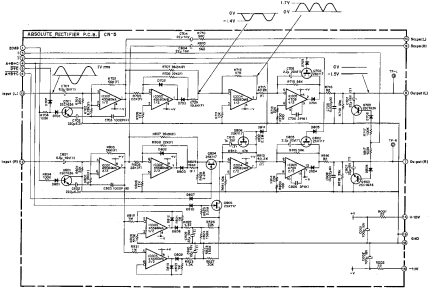


Fig. 6.7.1 Current Type

Conditions:
Input Signal — 1 V rms 1 kHz
Input Range SW — 0 dB
Meter Range SW — 0 dB
Function Control — Level

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

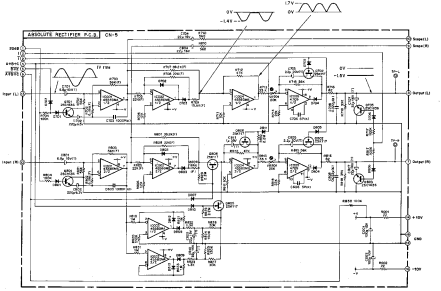


Fig. 6.7.3 Previous Type

Conditions:
Input Signal — 1 V rms 1 kHz
Input Range SW — 0 dB
Meter Range SW — 0 dB
Function Control — Level

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

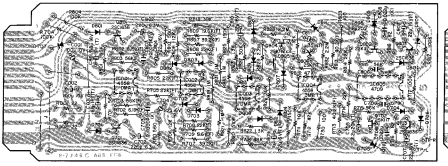


Fig. 6.7.2 Current Type

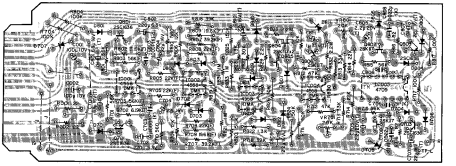
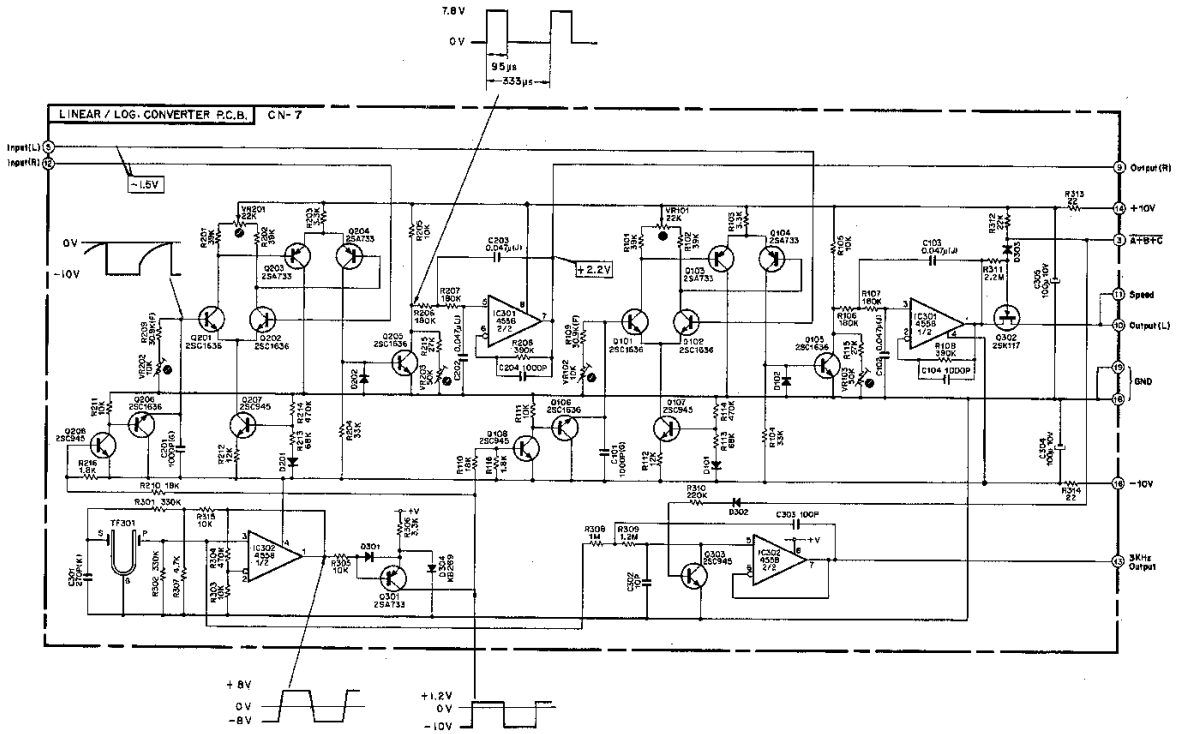


Fig. 6.7.4 Previous Type

NAKA-00088 / DRUCK 14

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA03886B	Absolute Rectifier P.C.B. Ass'y Current Type		BA03886B	Absolute Rectifier P.C.B. Ass'y Previous Type
	0B07745C	Absolute Rectifier P.C.B.		0B07745C	Absolute Rectifier P.C.B.
IC001,003	0B06160A	IC RC4558DMA	IC001,003	0B06160A	IC RC4558DMA
IC002,004	0B06151A	IC RC4558DMB	IC002,004	0B06151A	IC RC4558DMB
IC005	0B06027A	IC 4709	IC005	0B06027A	IC 4709
D701-707 801-813	0B01909A	Silicon Diode 1S1555 (20 pcs.)	D701-707 801-813	0B01909A	Silicon Diode 1S1555 (20 pcs.)
Q701,703 801,803	0B06070A	Transistor 2SC1636	Q701,703 801,803	0B06070A	Transistor 2SC1636
Q702,802 804,805 806	0B06129A	FET 2SK117	Q702,802 804,805 806	0B06129A	FET 2SK117
R001,002	0B05579A	Carbon Resistor 22 ERD-25T J	VR701,801	0B09061A	Semi-fixed Volume 20K
R701,801	0B05508A	Carbon Resistor 56K ERD-25T J	R001,002	0B05579A	Carbon Resistor 22 ERD-25T J
R702,802	0B09011A	Metal Film Resistor 6.19K ERO-25CK F	R701,715 801,815	0B05508A	Carbon Resistor 56K ERD-25T J
R703,715 803,815	0B09012A	Metal Film Resistor 56K ERO-25CK F	R702,802	0B09011A	Metal Film Resistor 6.19K ERO-25CK F
R704,717 804,817	0B01889A	Carbon Resistor 100K ERD-25T J	R703,803	0B09012A	Metal Film Resistor 56K ERO-25CK F
R705,708 805,808	0B05968A	Metal Film Resistor 22K ERO-25CK F	R704,717 804,817 830	0B01889A	Carbon Resistor 100K ERD-25T J
R706,806	0B05771A	Carbon Resistor 12K ERD-25T J	R705,708 805,808	0B05968A	Metal Film Resistor 22K ERO-25CK F
R707,807	0B09080A	Metal Film Resistor 39.2K ERO-25CK F	R706,806	0B05771A	Carbon Resistor 12K ERD-25T J
R709,809	0B09051A	Metal Film Resistor 19.6K ERO-25CK F	R707,807	0B09080A	Metal Film Resistor 39.2K ERO-25CK F
R710,810	0B05575A	Carbon Resistor 560 ERD-25T J	R709,809	0B09051A	Metal Film Resistor 19.6K ERO-25CK F
R711,811	0B01888A	Carbon Resistor 10K ERD-25T J	R710,810	0B05575A	Carbon Resistor 560 ERD-25T J
R712,812	0B09135A	Metal Film Resistor 47K ERO-25CK F	R711,811	0B01888A	Carbon Resistor 10K ERD-25T J
R713,813	0B09136A	Metal Film Resistor 40.2K ERO-25CK F	R712,812	0B05641A	Carbon Resistor 47K ERD-25T J
R714,814	0B05615A	Carbon Resistor 22K ERD-25T J	R713,813	0B05509A	Carbon Resistor 33K ERD-25T J
R716,816	0B05631A	Carbon Resistor 82 ERD-25T J	R714,814	0B05615A	Carbon Resistor 22K ERD-25T J
R718, 818	0B01854A	Carbon Resistor 39K ERD-25T J	R716,816	0B05631A	Carbon Resistor 82 ERD-25T J
R730,830	0B01679A	Carbon Resistor 100 ERD-25T J	R718,818	0B01854A	Carbon Resistor 39K ERD-25T J
R819,821 831,833	0B05776A	Carbon Resistor 1M ERD-25T J	R819,821 831,833	0B05776A	Carbon Resistor 1M ERD-25T J
R820	0B09054A	Carbon Resistor 510K ERD-25T J	R820	0B09054A	Carbon Resistor 510K ERD-25T J
R822,823	0B09074A	Carbon Resistor 1.3K ERD-25T J	R822,823	0B09074A	Carbon Resistor 1.3K ERD-25T J
R824,825	0B05626A	Carbon Resistor 150K ERD-25T J	R824,825	0B05626A	Carbon Resistor 150K ERD-25T J
R826,827	0B09075A	Carbon Resistor 30K ERD-25T J	R826,827	0B09075A	Carbon Resistor 30K ERD-25T J
R828,829 832	0B05671A	Carbon Resistor 2.2M ERD-25T J	R828,829 832	0B05671A	Carbon Resistor 2.2M ERD-25T J
C001,002	0B05885A	Electrolytic Capacitor 100μ 10V	C001,002	0B05885A	Electrolytic Capacitor 100μ 10V
C701,801	0B05769A	Tantalum Capacitor 6.8μ 16V	C701,801	0B05769A	Tantalum Capacitor 6.8μ 16V
C702,802	0B01394A	Electrolytic Capacitor 220μ 6.3V	C702,802	0B01394A	Electrolytic Capacitor 220μ 6.3V
C703,803	0B04025A	Ceramic Capacitor 1000P 50V K	C703,803	0B04025A	Ceramic Capacitor 1000P 50V K
C704,804	0B01862A	Electrolytic Capacitor 22μ 16V	C704,804	0B01862A	Electrolytic Capacitor 22μ 16V
C705,805	0B05598A	Tantalum Capacitor 2.2μ 20V	C705,805	0B05598A	Tantalum Capacitor 2.2μ 20V
C706,806	0B05905A	Ceramic Capacitor 5P 50V K	C706,806	0B05905A	Ceramic Capacitor 5P 50V K
C707,807 809,810	0B05636A	Tantalum Capacitor 22μ 16V	C707,807 809,810	0B05636A	Tantalum Capacitor 22μ 16V
C708,808	0B04062A	Mylar Capacitor 0.022μ 50V K	C708,808	0B04062A	Mylar Capacitor 0.022μ 50V K
C811	0B05638A	Tantalum Capacitor 1μ 35V	C811	0B05638A	Tantalum Capacitor 1μ 35V
TP-L, R	0B03924A	Gate Pin	TP-L,R	0B03924A	Gate Pin
	0B05202A	Glass Tube 25mm (2 pcs.)		0B05202A	Glass Tube 25mm (2 pcs.)

6.8. Linear/Log. Converter P.C.B. Ass'y



Conditions:
Input Signal – 1 V rms 1 kHz
Input Range SW – 0 dB
Meter Range SW – 0 dB
Function Control – Level

Fig. 6.8.1

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

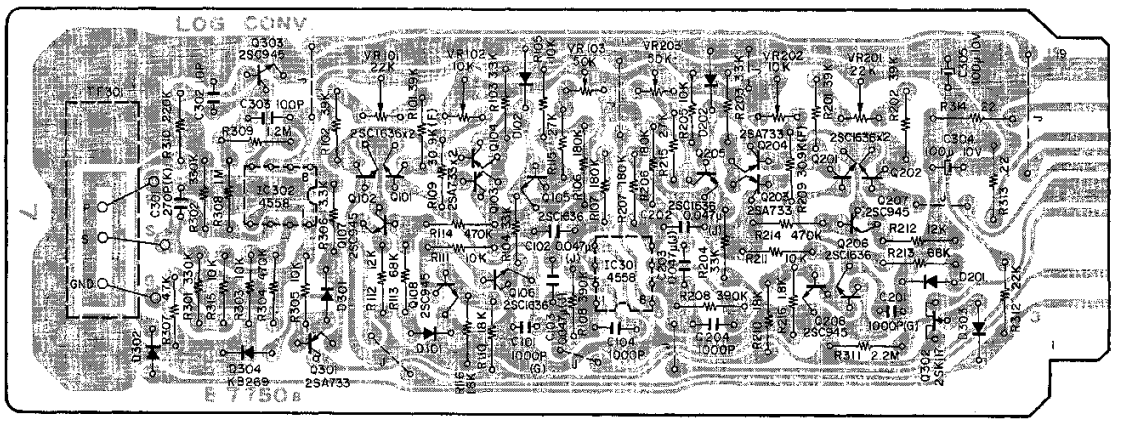
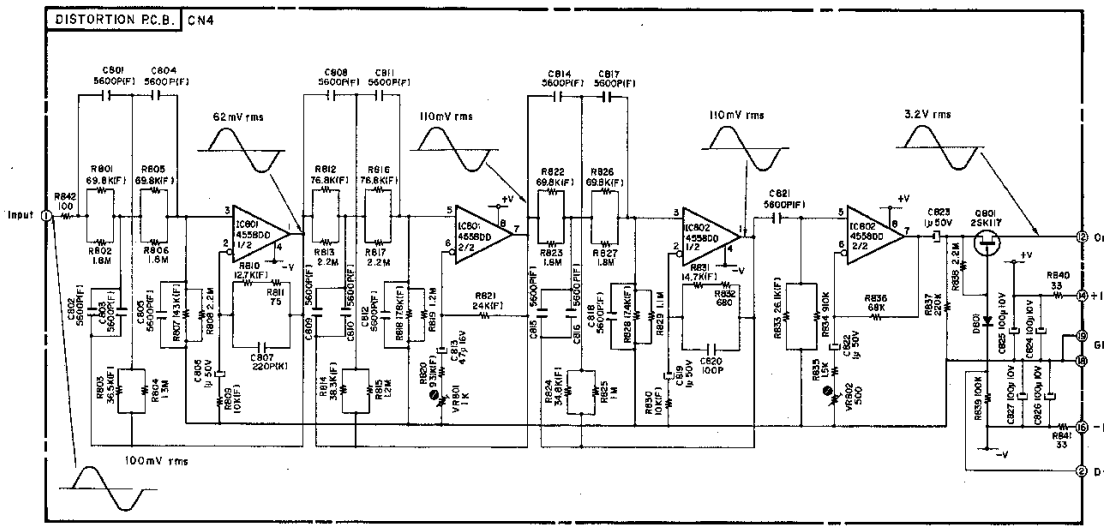


Fig. 6.8.2

Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	BA03888A	Linear/Log. Converter P.C.B. Ass'y	R112,212	0B05771A	Carbon Resistor 12K ERD-25T J
			R113,213	0B05692A	Carbon Resistor 68K ERD-25T J
	0B07750B	Linear/Log. Converter P.C.B.	R114,214	0B01684A	Carbon Resistor 470K ERD-25T J
IC301,302	0B06124B	IC RC4558D	304		
Q101,102	0B06070A	Transistor 2SC1636	R115,215	0B05743A	Carbon Resistor 27K ERD-25T J
105,106			R116,216	0B05614A	Carbon Resistor 1.8K ERD-25T J
201,202			R301,302	0B05627A	Carbon Resistor 330K ERD-25T J
205,206			R307	0B01846A	Carbon Resistor 4.7K ERD-25T J
Q103,104	0B06013A	Transistor 2SA733	R308	0B05776A	Carbon Resistor 1M ERD-25T J
203,204			R309	0B05962A	Carbon Resistor 1.2M ERD-25T J
301			R310	0B05625A	Carbon Resistor 220K ERD-25T J
Q107,108	0B06100A	Transistor 2SC945 (A)	R311	0B05671A	Carbon Resistor 2.2M ERD-25T J
207,208			R312	0B05615A	Carbon Resistor 22K ERD-25T J
303			R313,314	0B05579A	Carbon Resistor 22 ERD-25T J
Q302	0B06129A	FET 2SK117	C101,201	0B09043A	SP Capacitor 1000P 50V G
D101,102	0B01909A	Silicon Diode 1S1555	C102,103	0B05796A	Mylar Capacitor 0.047μ 50V J
201,202			202,203		
301,302			C104,204	0B04025A	Ceramic Capacitor 1000P 50V
303			C301	0B09076A	Ceramic Capacitor 270P 50V K
D304	0B01702A	Varistor KB269	C302	0B09077A	Ceramic Capacitor 10P 50V
VR101,201	0B07185A	Semi-fixed Volume 22K (B)	C303	0B01288A	Ceramic Capacitor 100P 50V
VR102,202	0B07191A	Semi-fixed Volume 10K (B)	C304,305	0B05885A	Electrolytic Capacitor 100μ 10V
VR103,203	0B07166A	Semi-fixed Volume 50K (B)	TF301	0B08404A	Micro Fork
R101,102	0B01854A	Carbon Resistor 39K ERD-25T J		0B05204A	Tube F 13mm (2 pcs.)
201,202				0B08461B	T.F. Holder (1 pce.)
R103,203	0B01681A	Carbon Resistor 3.3K ERD-25T J		0B08462A	T.F. Pin (1 pce.)
306				0B05202A	Glass Tube 25mm (2 pcs.)
R104,204	0B05509A	Carbon Resistor 33K ERD-25T J			
R105,111	0B01888A	Carbon Resistor 10K ERD-25T J			
205,211					
303,305					
315					
R106,107	0B05640A	Carbon Resistor 180K ERD-25T J			
206,207					
R108,208	0B05676A	Carbon Resistor 390K ERD-25T J			
R109,209	0B09055A	Metal Film Resistor 30.9K ERO-25CK F			
R110,210	0B05560A	Carbon Resistor 18K ERD-25T J			

6.9. Distortion P.C.B. Ass'y



Conditions:
Input Signal — 100 mV rms 1 kHz
Input Range SW — 0 dB
Function Control — Level T.H. Dist. L or R

Fig. 6.9.1

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

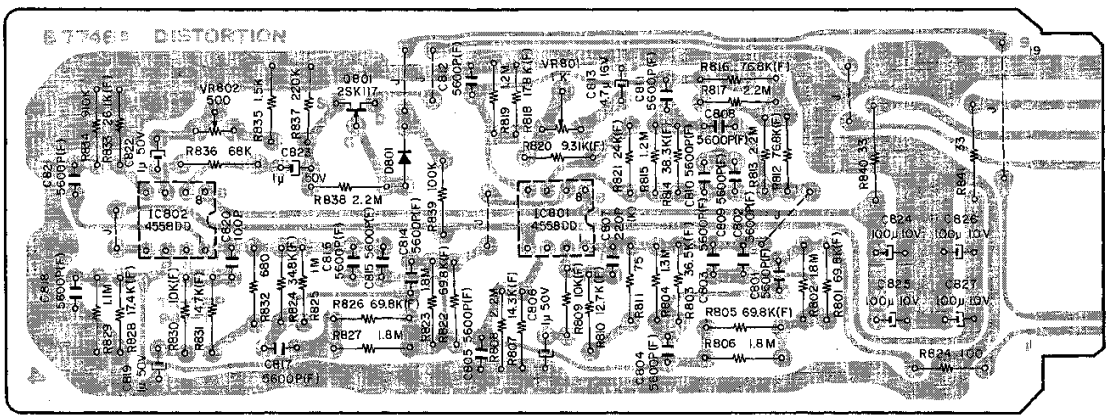


Fig. 6.9.2

Schematic Ref. No.	Part No.	Description
	BA03885A	**Distortion P.C.B. Ass'y**
	0B07746B	Distortion P.C.B.
IC801,802	0B06146A	IC RC4558DD
Q801	0B06129A	FET 2SK117
D801	0B01909A	Silicon Diode 1S1555
VR801	0B07192A	Semi-fixed Volume 1K (B)
VR802	0B01883A	Semi-fixed Volume 500 (B)
R801,805 822,826	0B09009A	Metal Film Resistor 69.8K ERO-25CK F
R802,806 823,827	0B05680A	Carbon Resistor 1.8M ERD-25T J
R803	0B09007A	Metal Film Resistor 36.5K ERO-25CK F
R804	0B05963A	Carbon Resistor 1.3M ERD-25T J
R807	0B06000A	Metal Film Resistor 14.3K ERO-25CK F
R808,813 817,838	0B05671A	Carbon Resistor 2.2M ERD-25T J
R809,830	0B09014A	Metal Film Resistor 10K ERO-25CK F
R810	0B05999A	Metal Film Resistor 12.7K ERO-25CK F
R811	0B05959A	Carbon Resistor 75 ERD-25T J
R812,816	0B09010A	Metal Film Resistor 76.8K ERO-25CK F
R814	0B09008A	Metal Film Resistor 38.3K ERO-25CK F
R815,819	0B05962A	Carbon Resistor 1.2M ERD-25T J
R818	0B09003A	Metal Film Resistor 17.8K ERO-25CK F
R820	0B05970A	Metal Film Resistor 9.31K ERO-25CK F
R821	0B09005A	Metal Film Resistor 24.0K ERO-25CK F
R824	0B09006A	Metal Film Resistor 34.8K ERO-25CK F
R825	0B05776A	Carbon Resistor 1M ERD-25T J
R828	0B09002A	Metal Film Resistor 17.4K ERO-25CK F
R829	0B05961A	Carbon Resistor 1.1M ERD-25T J
R831	0B09001A	Metal Film Resistor 14.7K ERO-25CK F
R832	0B05794A	Carbon Resistor 680 ERD-25T J
R833	0B09053A	Metal Film Resistor 26.1K ERO-25CK F
R834	0B05960A	Carbon Resistor 910K ERD-25T J
R835	0B05698A	Carbon Resistor 1.5K ERD-25T J

Schematic Ref. No.	Part No.	Description
R836	0B05692A	Carbon Resistor 68K ERD-25T J
R837	0B05625A	Carbon Resistor 220K ERD-25T J
R839	0B01889A	Carbon Resistor 100K ERD-25T J
R840,841	0B01713A	Carbon Resistor 33 ERD-25T J
R842	0B01679A	Carbon Resistor 100 ERD-25T J
C801-805 808-812 814-818 821	0B09232A	PP Capacitor 5600P 100V F (16 pcs.)
C806,819 822,823	0B01405A	Electrolytic Capacitor 1μ 50V
C807	0B05879A	Ceramic Capacitor 220P 50V K
C813	0B01389A	Electrolytic Capacitor 4.7μ 16V
C820	0B01288A	Ceramic Capacitor 100P 50V
C824,825 826,827	0B05885A	Electrolytic Capacitor 100μ 10V
	0B05202A	Glass Tube 25mm (2 pcs.)

6.10. Volume P.C.B. Ass'y

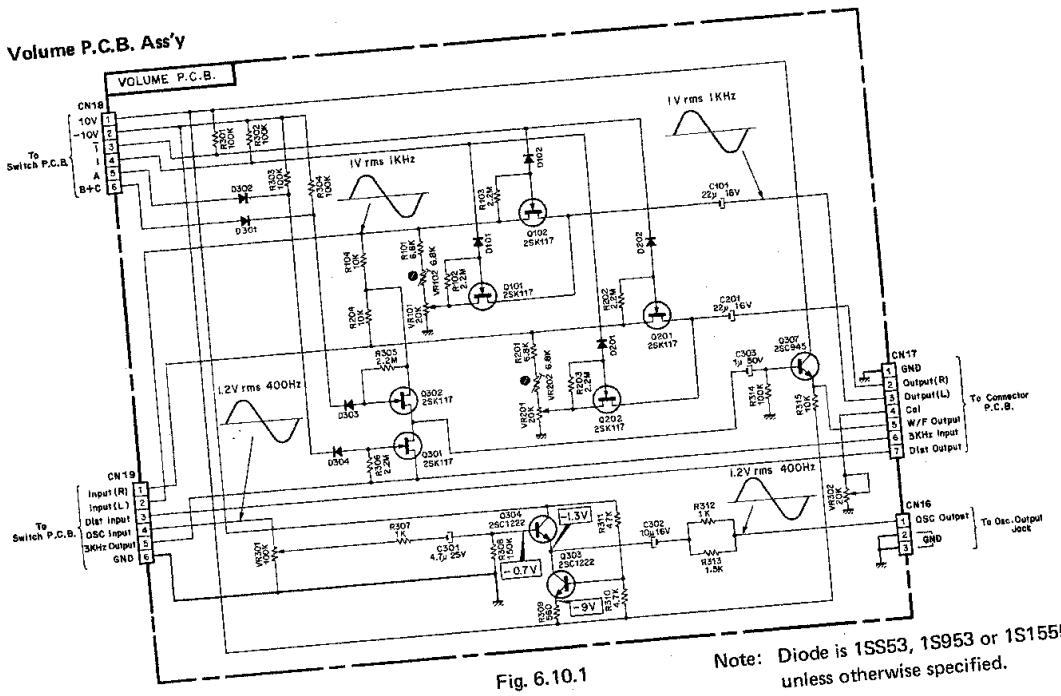


Fig. 6.10.1

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

Conditions:
Input Signal – 1 V rms 1 kHz
Input Range SW – 0 dB
Function Control – Level
Oscillator Control – 400 Hz
Osc. Output Control – Max.

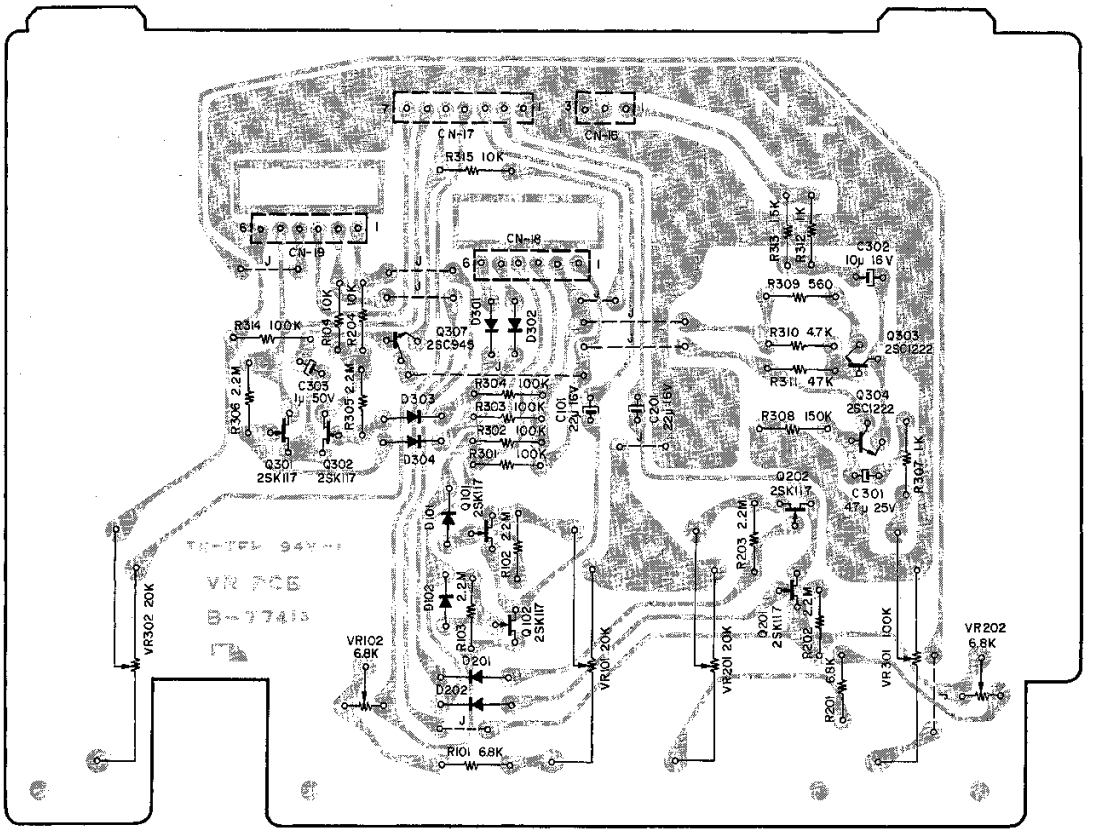
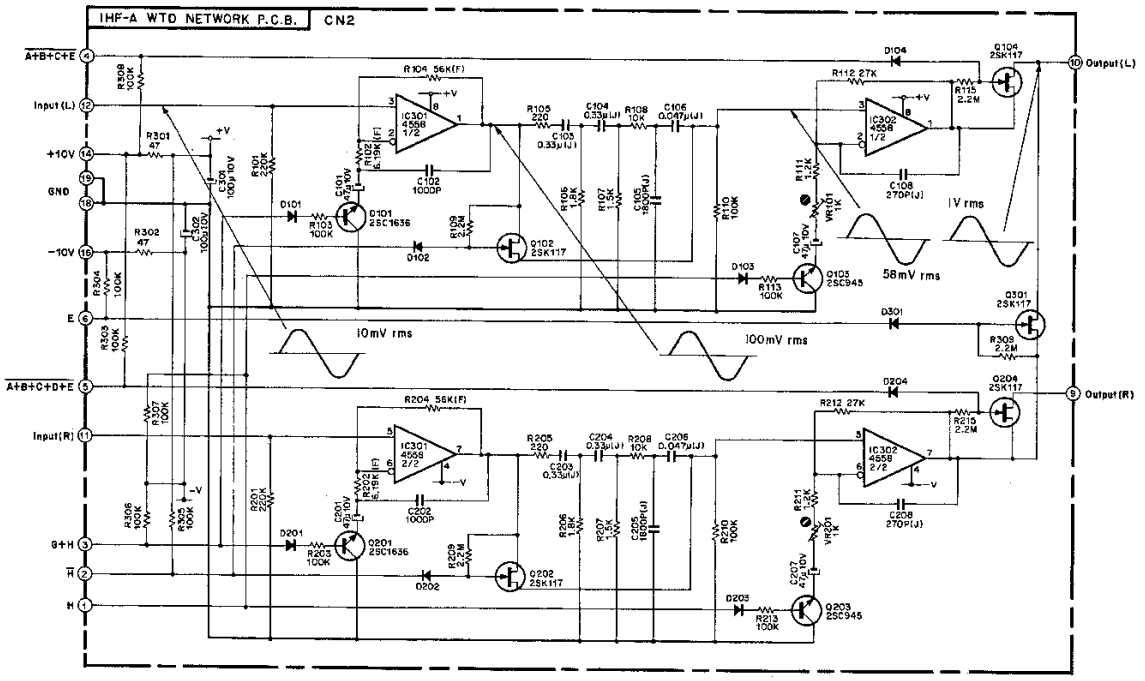


Fig. 6.10.2

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description		
	BA03891A	**Volume P.C.B. Ass'y**		R301,302 303,304 314	0B01889A	Carbon Resistor	100K	ERD-25T J
	0B07741B	Volume P.C.B.						
D101,102 201,202 301,302 303,304	0B01909A	Silicon Diode	1S1555	R307,312	0B01857A	Carbon Resistor	1K	ERD-25T J
				R308	0B05626A	Carbon Resistor	150K	ERD-25T J
				R309	0B05575A	Carbon Resistor	560	ERD-25T J
				R310	0B01846A	Carbon Resistor	4.7K	ERD-25T J
Q101,102 201,202 301,302	0B06129A	FET	2SK117	R311	0B05641A	Carbon Resistor	47K	ERD-25T J
				R313	0B05698A	Carbon Resistor	1.5K	ERD-25T J
				C101,201	0B01862A	Electrolytic Capacitor	22μ	16V
Q303,304	0B06062A	Transistor	2SC1222	C301	0B01402A	Electrolytic Capacitor	4.7μ	25V
Q307	0B06100A	Transistor	2SC945 (A)	C302	0B01412A	Electrolytic Capacitor	10μ	16V
VR101,201 302	0B07194A	Volume	20K	C303	0B01405A	Electrolytic Capacitor	1μ	50V
				CN16	0B08184A	3P-T Post		
VR102,202	0B09124A	Semi-fixed Volume	6.8K (B)	CN17	0B08451A	7P-T Post		
VR301	0B07195A	Volume	100K	CN18, 19	0B08442A	6P-B Post		
R101,201	0B01682A	Carbon Resistor	6.8K ERD-25T J					
R102,103 202,203 305,306	0B05671A	Carbon Resistor	2.2M ERD-25T J					
R104,204 315	0B01888A	Carbon Resistor	10K ERD-25T J					

6.11. IHF-A WTD Network P.C.B. Ass'y



Conditions:
Input Signal – 10 mV rms 1 kHz
Input Range SW – 0 dB
Function Control – Noise-A

Fig. 6.11.1

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

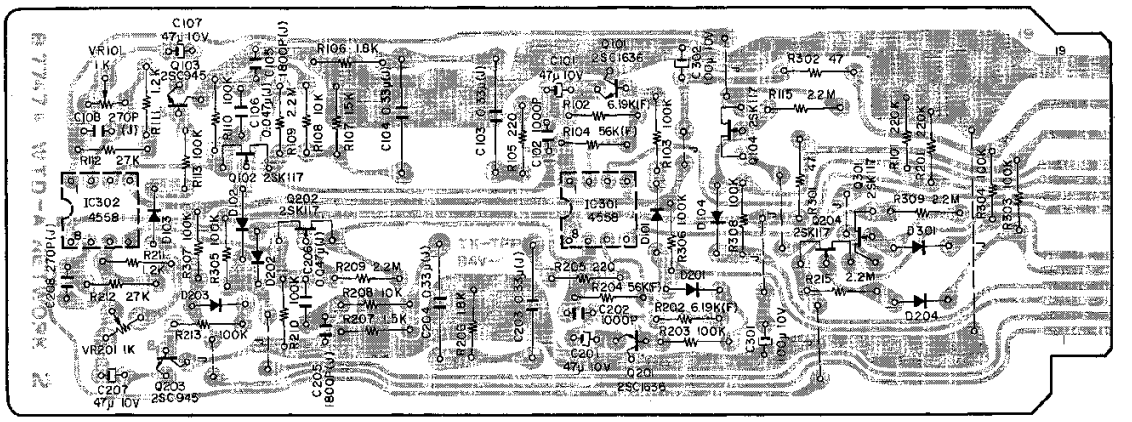
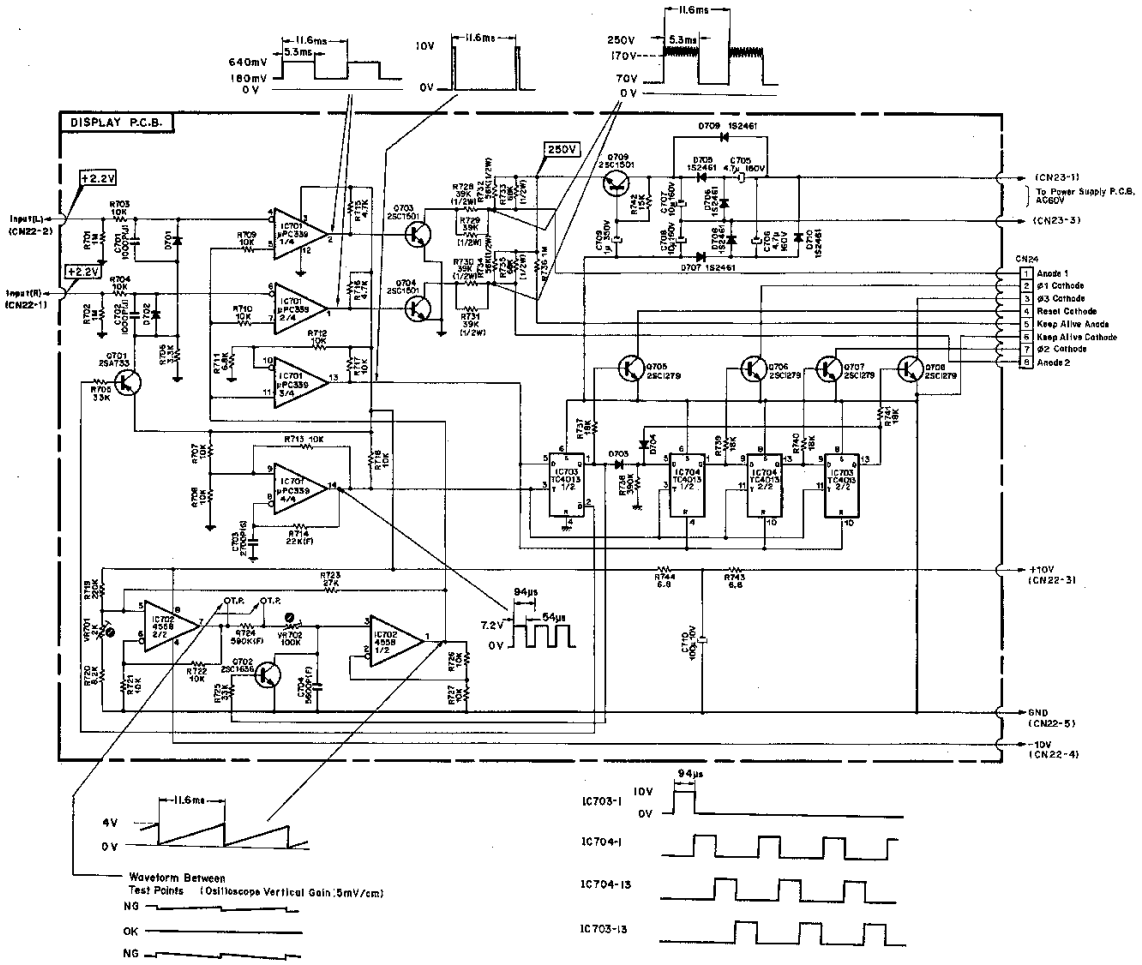


Fig. 6.11.2

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description	
	BA03883A	**IHF-A WTD Network P.C.B. Ass'y**		C106,206	0B05796A	Mylar Capacitor	0.047μ 50V J
				C108,208	0B09058A	Ceramic Capacitor	270P 50V J
	0B07747B	IHF-A WTD Network P.C.B.		C301,302	0B05885A	Electrolytic Capacitor	100μ 10V
IC301,302	0B06124B	IC	RC4558D		0B05202A	Glass Tube 25mm	(2 pcs.)
Q101,201	0B06070A	Transistor	2SC1636				
Q102,104 202,204 301	0B06129A	FET	2SK117				
Q103,203	0B06100A	Transistor	2SC945 (A)				
D101-104 201-204 301	0B01909A	Silicon Diode	1S1555 (9 pcs.)				
VR101,201	0B07180A	Semi-fixed Volume	1K				
R101,201	0B05625A	Carbon Resistor	220K ERD-25T J				
R102,202	0B09011A	Metal Film Resistor	6.19K ERO-25CK F				
R103,110 113,203 210,213 303-308	0B01889A	Carbon Resistor	100K ERD-25T J (12 pcs.)				
R104,204	0B09012A	Metal Film Resistor	56K ERO-25CK F				
R105,205	0B01933A	Carbon Resistor	220 ERD-25T J				
R106,206	0B05614A	Carbon Resistor	1.8K ERD-25T J				
R107,207	0B05698A	Carbon Resistor	1.5K ERD-25T J				
R108,208	0B01888A	Carbon Resistor	10K ERD-25T J				
R109,115 209,215 309	0B05671A	Carbon Resistor	2.2M ERD-25T J				
R111,211	0B05623A	Carbon Resistor	1.2K ERD-25T J				
R112,212	0B05743A	Carbon Resistor	27K ERD-25T J				
R301,302	0B01706A	Carbon Resistor	47 ERD-25T J				
C101,107 201,207	0B01836A	Electrolytic Capacitor	47μ 10V				
C102,202	0B04025A	Ceramic Capacitor	1000P 50V				
C103,104 203,204	0B05844A	Mylar Capacitor	0.33μ 50V J				
C105,205	0B01913A	Mylar Capacitor	1800P 50V J				

6.12. Display P.C.B. Ass'y



Conditions:
Input Signal — 1 V rms 1 kHz
Input Range SW — 0 dB
Meter Range SW — 0 dB
Function Control — Level

Fig. 6.12.1

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

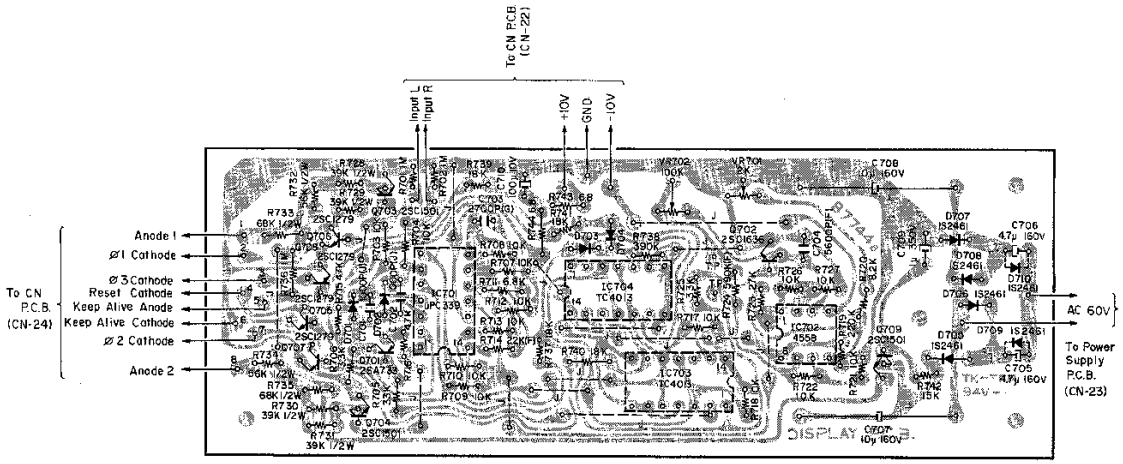


Fig. 6.12.2

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description	
	BA03889A	Display P.C.B. Ass'y		R724	0B09390A	Metal Film Resistor	590K CN15K2E F
				R728,729	0B09123A	Carbon Resistor	39K ERD-50T J
	0B07744B	Display P.C.B.		730,731			
IC701	0B06132A	IC	μPC339	R732,734	0B09129A	Carbon Resistor	56K ERD-50T J
IC702	0B06124B	IC	RC4558D	R733,735	0B09130A	Carbon Resistor	68K ERD-50T J
IC703,704	0B06133A	IC	TC4013BP	R737,739	0B05561A	Carbon Resistor	18K ERD-25V J
Q701	0B06013A	Transistor	2SA733	740,741			
Q702	0B06070A	Transistor	2SC1636	R738	0B05595A	Carbon Resistor	390K ERD-25V J
Q703,704	0B06135A	Transistor	2SC1501	R742	0B05591A	Carbon Resistor	15K ERD-25V J
709				R743,744	0B05857A	Carbon Resistor	6.8 ERD-25T J
Q705,706	0B06134A	Transistor	2SC1279	C701,702	0B05550A	Mylar Capacitor	1000P 50V J
707,708				C703	0B09041A	SP Capacitor	2700P 50V G
D701,702	0B01909A	Silicon Diode	1S1555	C704	0B09232A	PP Capacitor	5600P 100V F
703,704				C705,706	0B09382A	Electrolytic Capacitor	4.7μ 160V
D705,706	0B06136A	Silicon Diode	1S2461	C707,708	0B09040A	Electrolytic Capacitor	10μ 160V
707,708				C709	0B09038A	Electrolytic Capacitor	1μ 350V
709,710				C710	0B05885A	Electrolytic Capacitor	100μ 10V
VR701	0B09062A	Semi-fixed Volume	2K (B)		0B03924A	Gate Pin	(2 pcs.)
VR702	0B07220A	Semi-fixed Volume	100K (B)		0B08428A	D-P Connector A	(1 pce.)
R701,702	0B05564A	Carbon Resistor	1M ERD-25V J		0B08429A	D-P Connector B	(1 pce.)
736					0B05203A	Glass Tube 30mm	(8 pcs.)
R703,704	0B01833A	Carbon Resistor	10K ERD-25V J				
707,708							
709,710							
712,713							
717,718							
721,722							
726,727							
R705,725	0B01879A	Carbon Resistor	33K ERD-25V J				
R706	0B01793A	Carbon Resistor	3.3K ERD-25V J				
R711	0B01877A	Carbon Resistor	6.8K ERD-25V J				
R714	0B05968A	Metal Film Resistor	22K ERO-25CK F				
R715,716	0B01795A	Carbon Resistor	4.7K ERD-25V J				
R719	0B05596A	Carbon Resistor	220K ERD-25V J				
R720	0B01878A	Carbon Resistor	8.2K ERD-25V J				
R723	0B05538A	Carbon Resistor	27K ERD-25V J				

6.13. Analog Multiplier P.C.B. Ass'y

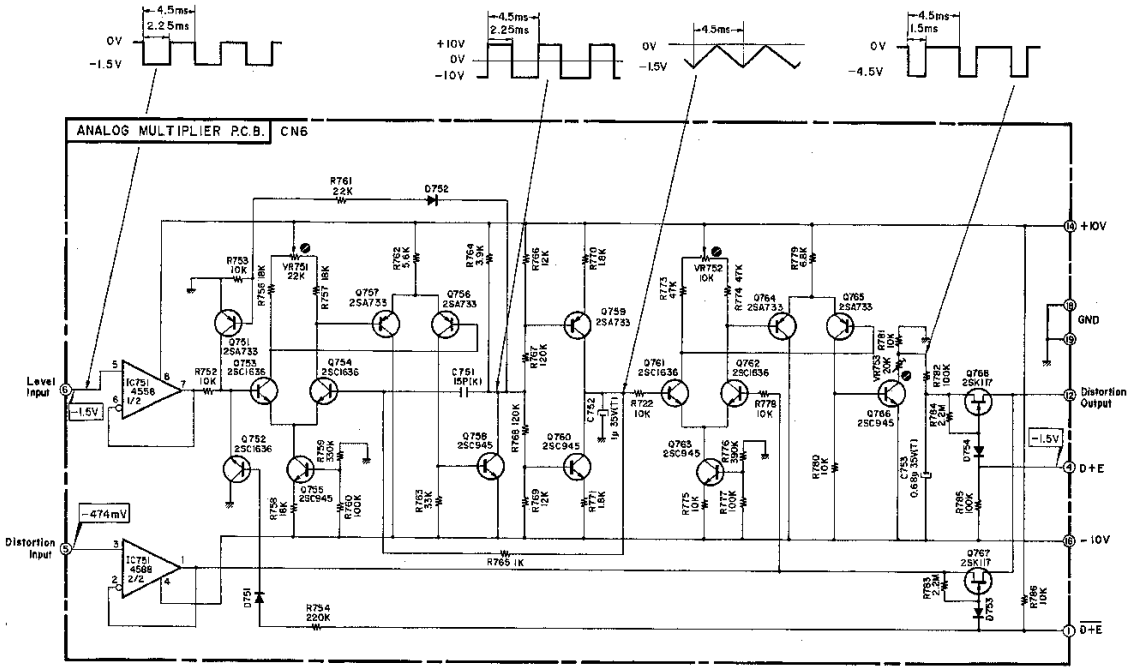


Fig. 6.13.1

Conditions:
Input Signal – 1 V rms 400 Hz
Distortion 1%
Input Range SW – 0 dB
Meter Range SW – 1%
Function Control – Level T.H. Dist. L or R

Note: Diode is 1SS53, 1S953 or 1S1555 unless otherwise specified.

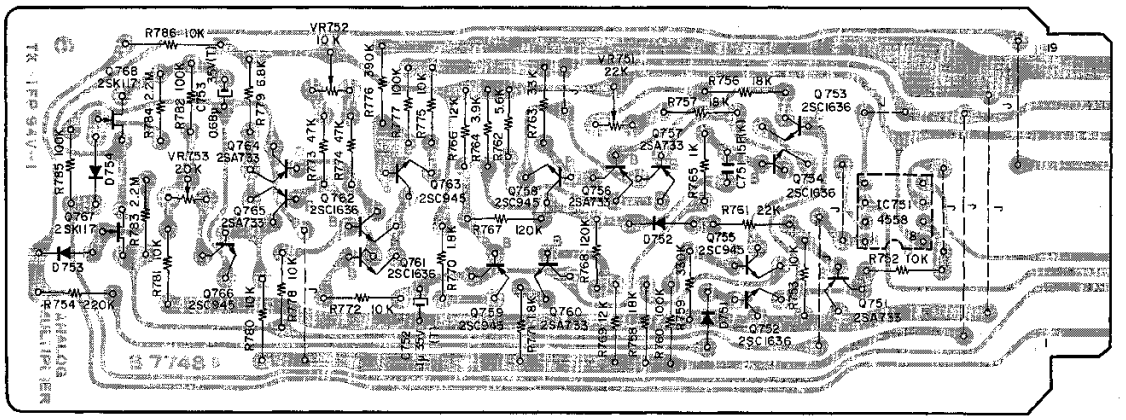


Fig. 6.13.2

Schematic Ref. No.	Part No.	Description		Schematic Ref. No.	Part No.	Description	
	BA03887A	**Analog Multiplier P.C.B. Ass'y**		R773,774	0B05641A	Carbon Resistor	47K ERD-25T J
				R776	0B05676A	Carbon Resistor	390K ERD-25T J
	0B07748B	Analog Multiplier P.C.B.		R779	0B01682A	Carbon Resistor	6.8K ERD-25T J
IC751	0B06124B	IC	RC4558D	R783,784	0B05671A	Carbon Resistor	2.2M ERD-25T J
D751,752	0B01909A	Silicon Diode	1S1555	C751	0B05887A	Ceramic Capacitor	15P 50V K
753,754				C752	0B05638A	Tantalum Capacitor	1μ 35V
Q751,756	0B06013A	Transistor	2SA733	C753	0B05773A	Tantalum Capacitor	0.68μ 35V
757,759					0B05204A	Tube F	13mm (2 pcs.)
764,765							
Q752,753	0B06070A	Transistor	2SC1636				
754,761							
762							
Q755,758	0B06100A	Transistor	2SC945 (A)				
760,763							
766							
Q767,768	0B06129A	FET	2SK117				
VR751	0B07185A	Semi-fixed Volume	22K (B)				
VR752	0B07184A	Semi-fixed Volume	10K (B)				
VR753	0B09061A	Semi-fixed Volume	20K (B)				
R752,753	0B01888A	Carbon Resistor	10K ERD-25T J				
772,775							
778,780							
781,786							
R754	0B05625A	Carbon Resistor	220K ERD-25T J				
R756,757	0B05560A	Carbon Resistor	18K ERD-25T J				
758							
R759	0B05627A	Carbon Resistor	330K ERD-25T J				
R760,777	0B01889A	Carbon Resistor	100K ERD-25T J				
782,785							
R761	0B05615A	Carbon Resistor	22K ERD-25T J				
R762	0B01887A	Carbon Resistor	5.6K ERD-25T J				
R763	0B05509A	Carbon Resistor	33K ERD-25T J				
R764	0B05675A	Carbon Resistor	3.9K ERD-25T J				
R765	0B01857A	Carbon Resistor	1K ERD-25T J				
R766,769	0B05771A	Carbon Resistor	12K ERD-25T J				
R767,768	0B05621A	Carbon Resistor	120K ERD-25T J				
R770,771	0B05614A	Carbon Resistor	1.8K ERD-25T J				

7. MECHANISM ASS'Y AND PARTS LIST

7.1. Synthesis

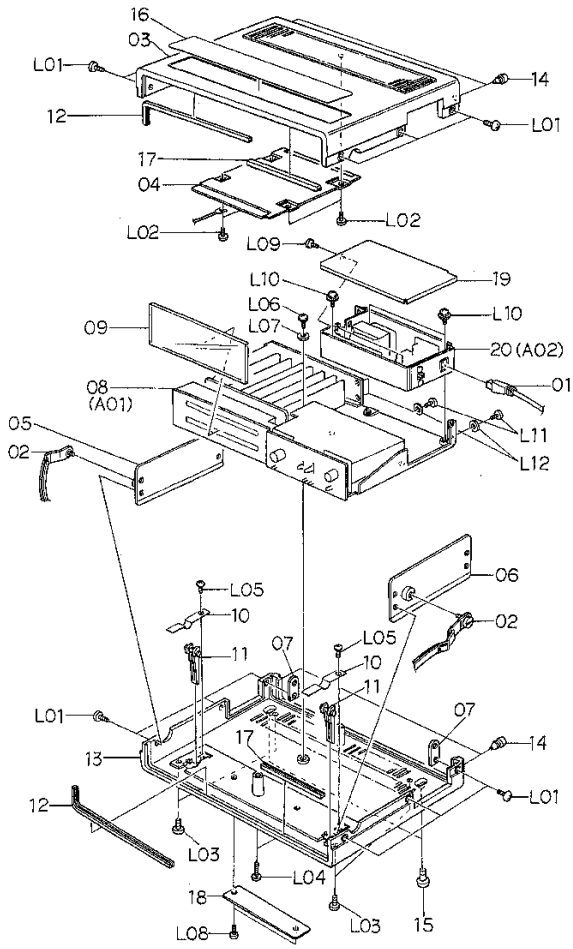


Fig. 7.1

Schematic Ref. No.	Part No.	Description	Q'ty
		Synthesis	
01	0B08422A	Power Cord (U.S.A., Canada & Others)	1
	0B08424A	Power Cord (UK & Australia)	1
	0B08423A	Power Cord (Sweden)	1
	0B08425A	Power Cord (Japan)	1
02	HA03735A	Shoulder Belt Ass'y	1
03	HA03734A	Top Cover Sub Ass'y	1
04	0J03758A	P.C.B. Guide Plate	1
05	JA03206B	Side Holder L Ass'y	1
06	JA03205B	Side Holder R Ass'y	1
07	0J03761A	Cover Holder	2
08	JA03326A	Synthesis Mechanism Ass'y	1
09	0H03568F	Acrylic Cover	1
10	0J03762A	Leg Spring	2
11	0A03282D	Leg	2
12	0J03768B	Acrylic Cover Holder	2
13	HA03733A	Bottom Cover Sub Ass'y	1
14	0A03283A	Rubber Foot	4
15	0H03437A	Rubber Foot	2
16	0H03569D	BD Name Plate	1
17	0J03891A	Cover Spacer	2
18	0M03875A	Caution Name Plate	1
19	0J03745C	Power Supply Box Cover	1
20	JA03213A	Power Supply Ass'y (U.S.A.)	1
	JA03215A	Power Supply Ass'y (UK & Australia)	1
	JA03216A	Power Supply Ass'y (Sweden)	1
	JA03441A	Power Supply Ass'y (Canada)	1
	JA03217A	Power Supply Ass'y (Japan)	1
	JA03340A	Power Supply Ass'y (Others 1)	1
	JA03334A	Power Supply Ass'y (Others 2)	1
–	0M03705A	Power Cord Label (UK & Australia)	1
L01	0E00713A	Screw M3x6 Philips Truss Head (Bronze)	12
L02	0E00502A	Screw M3x5 Philips Pan Head	4
L03	0E00738A	Screw M4x6 Philips Binding Head (Bronze)	4
L04	0E00818A	Screw M3x8 Philips Binding Head (Black Chromate)	2
L05	0E00776A	Screw M2.6x3 Philips Pan Head (Bronze)	2
L06	0E00667A	Screw M4x6 Philips Pan Head (2A)	1
L07	0E00141A	Washer 4mm	1
L08	0E00774A	BT Screw M2.6x5 philips Pan Head (Bronze)	2
L09	0E00778A	Screw M2.6x5 Philips Binding Head (Bronze)	1
L10	0E00606A	Screw M3x6 Philips Pan Head (3A)	4
L11	0E00540A	Screw M3x5 Philips Binding Head (Bronze)	3
L12	0E00157A	Washer 3mm (Black Plastics)	3

7.2. Synthesis Mechanism Ass'y (A01)

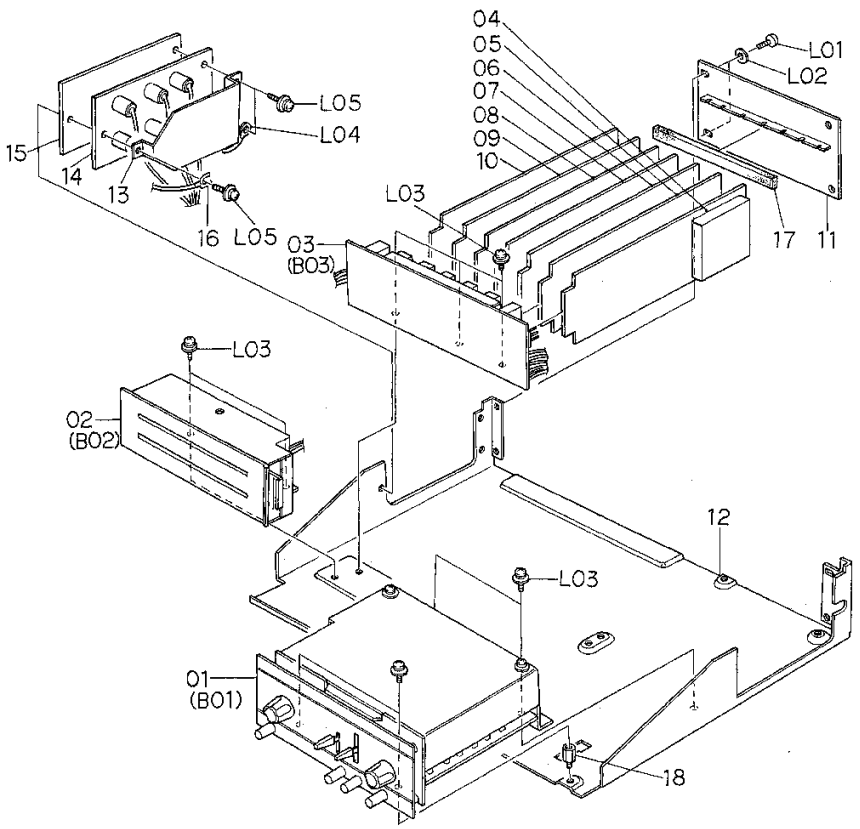


Fig. 7.2

Schematic Ref. No.	Part No.	Description	Q'ty	Schematic Ref. No.	Part No.	Description	Q'ty
A01	JA03326A	**Synthesis Mechanism Ass'y**	1	17	0J03774A	P.C.B. Pad	1
				18	0J03756A	Switch Stud	2
01	JA03218A	Switch Control Ass'y	1	–	0M04053A	Input Indication Label	1
02	JA03219A	Bar-graph Holder Ass'y	1	L01	0E00540A	Screw M3x5 Philips Binding Head (Bronze)	2
03	JA03221A	Connector Ass'y	1				
04	BA03882A	Oscillator P.C.B. Ass'y	1	L02	0E00157A	Washer 3mm (Black Plastics)	2
05	BA03883A	IHF-A WTD Network P.C.B. Ass'y	1	L03	0E00606A	Screw M3x6 Philips Pan Head (3A)	9
06	BA03884A	Wow & Flutter P.C.B. Ass'y	1	L04	0E00037A	Earth Lug B-5	1
07	BA03885A	Distortion P.C.B. Ass'y	1	L05	0E00607A	Screw M3x8 Philips Pan Head (3A)	3
08	BA03886B	Absolute Rectifier P.C.B. Ass'y	1				
09	BA03887A	Analogue Multiplier P.C.B. Ass'y	1				
10	BA03888A	Linear/Log. Converter P.C.B. Ass'y	1				
11	JA03202D	Rear Panel B Ass'y	1				
12	JA03220A	Main Chassis Sub Ass'y	1				
13	0J03778B	Shield Plate	1				
14	BA03897A	6P Pin Jack Ass'y	1				
15	0H03566D	Pin Jack Name Plate	1				
16	0B08446A	Cord with Terminal A	1				

7.3. Power Supply Ass'y (A02)

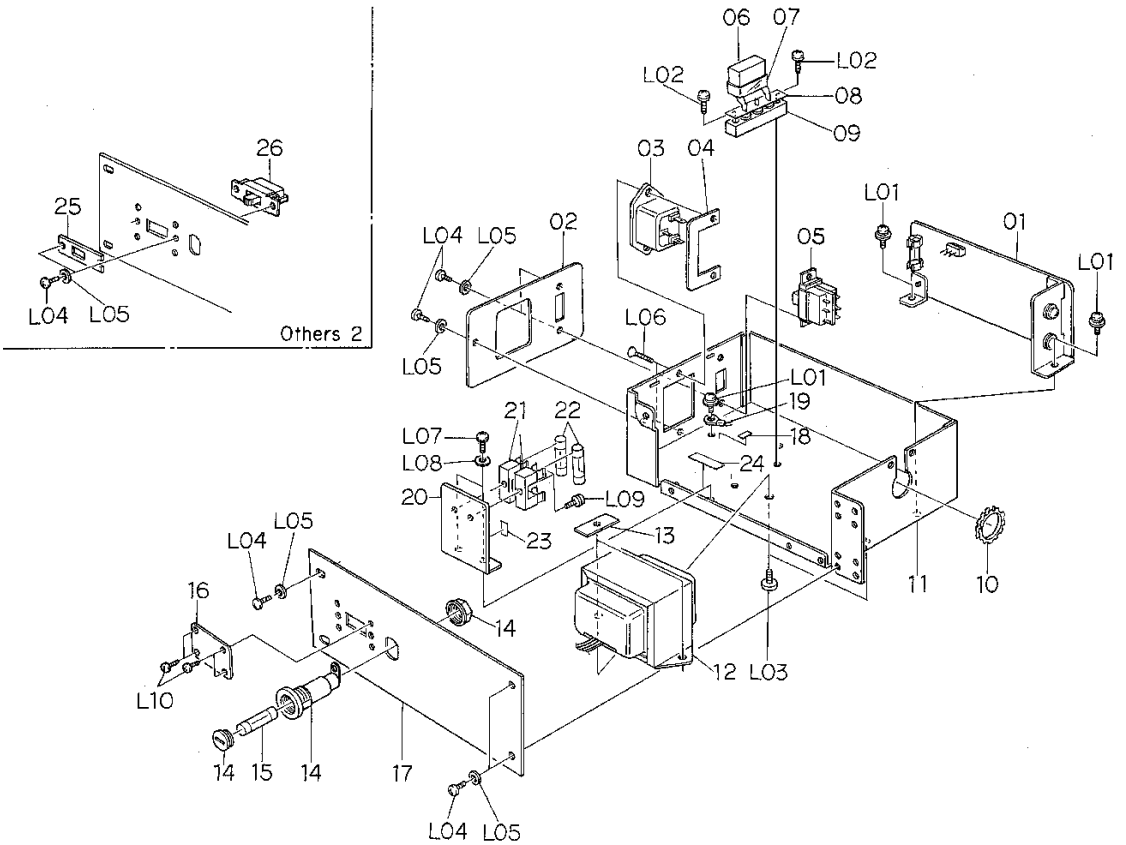


Fig. 7.3

Schematic Ref. No.	Part No.	Description	Q'ty
A02	JA03213A	**Power Supply Ass'y (U.S.A.)**	1
	JA03215A	**Power Supply Ass'y (UK & Australia)**	1
	JA03216A	**Power Supply Ass'y (Sweden)**	1
	JA03441A	**Power Supply Ass'y (Canada)**	1
	JA03217A	**Power Supply Ass'y (Japan)**	1
	JA03340A	**Power Supply Ass'y (Others 1)**	1
	JA03334A	**Power Supply Ass'y (Others 2)**	1
01	BA03895A	Power Supply P.C.B. Ass'y (U.S.A. & Canada)	1
	BA03892A	Power Supply P.C.B. Ass'y (UK, Australia, Sweden, Japan & Others 1 & 2)	1
02	0H03567D	Power Supply Name Plate	1
03	0B08414A	A.C. Inlet	1
04	0J03742A	Inlet Holder	1
05	0B07172A	Power Switch (U.S.A. & Canada)	1
	0B07092A	Power Switch (UK, Sweden, Australia, Others 1 & 2)	1
	0B07305A	Power Switch (Japan)	1
06	0B08342A	Spark Killer (U.S.A. & Canada)	1
	0B08240A	Spark Killer (UK, Australia & Others 1)	1
	0B08445A	Spark Killer (Sweden)	1
	0B08363A	Spark Killer (Japan)	1
	0B08240U	Spark Killer (Others 2)	1
*07	0B08359A	Spark Killer Cover	2
08	0B08410A	3P Terminal Insulator (U.S.A. & Canada)	1
	0B08268U	5P Terminal Insulator 05 (UK, Sweden, Australia & Others 1)	1
	0B08030U	3P Terminal Insulator (Japan)	1
	0B08270U	3P Terminal Insulator 05 (Others 2)	1
09	0B08024U	3P Terminal Strip (U.S.A., Canada, Japan & Others 2)	1
	0B08025U	5P Terminal Strip (UK, Sweden, Australia & Others 1)	1
10	0B08503A	Free Bushing 143mm	1
11	0J03737E	Power Supply Box	1
12	0B06573A	Power Transformer (U.S.A. & Canada)	1
	0B06574A	Power Transformer (UK, Sweden, Australia & Others 1)	1
	0B06572A	Power Transformer (Japan)	1
	0B06590A	Power Transformer (Others 2)	1
13	0C01162B	Bolt Receptacle Plate	2
14	0B08418A	Fuse Holder (U.S.A. & Japan)	1
	0B08421A	Fuse Holder (UK, Sweden, Australia & Others 1 & 2)	1
15	0B08419A	Fuse 250mA 250V (U.S.A. & Japan)	1
	0B08360A	Fuse 125mA 250V (UK, Sweden, Australia & Others 1 & 2)	1
16	0M03874B	Fuse Caution Name Plate (U.S.A., UK, Sweden, Australia, Others 1 & Japan)	1
	0M03972A	Caution Name plate (Canada)	1
17	0J03747J	Rear Panel A	1
18	0M03700A	Ground Label	1
20	0J03744B	Fuse Holder Plate (Except for U.S.A. & Others 2)	1
*21	0B08048A	Fuse Holder (Except for U.S.A. & Others 2)	2
22	0B08161U	Fuse 630mA, T 250V (Sweden, UK, Australia & Others 1)	2
	0B08161A	Fuse 630mA, T 250V (Japan)	2
	0B08608A	Fuse 250mA 250V (Canada)	1
23	0M03745A	Fuse Label 630mA Tx2 (Sweden, UK, Japan, Australia & Others 1)	1
	0M03970A	Fuse Label 250mA (Canada)	1
24	0M03971A	Fuse Caution Label (Canada)	1
25	0B03947A	Voltage Selector Lock Plate (Others 2)	1
26	0B07092U	Voltage Selector Switch (Others 2)	1
19	0B08447A	Cord with Terminal B	1
–	0M03794A	Voltage Seal 100V (Japan)	1
–	0M03795A	Voltage Seal 120V (U.S.A. & Canada)	1
–	0M03797A	Voltage Seal 240V (UK & Australia)	1
–	0M03796A	Voltage Seal 220V (Sweden & Others 1)	1
–	0M03955A	Voltage Seal B (Others 2)	1
–	0M03899A	Serial Number Plate	1
–	0J03644A	Chobert Rivet	2
–	0M03458B	Pass Label	1
–	0M03959A	File Number Label B (Canada)	1
L01	0E00606A	Screw M3x6 Philips Pan Head (3A)	3
L02	0E00510A	Screw M3x8 Philips Pan Head (2A)	2
L03	0E00738A	Screw M4x6 Philips Binding Head	2
*L04	0E00540A	Screw M3x5 Philips Binding Head (Bronze)	8
*L05	0E00157A	Washer 3mm (Black Plastics)	8
L06	0E00518A	Screw M3x8 Philips Countersunk	2
*L07	0E00622A	Screw M3x5 Philips Pan Head (2A)	2
*L08	0E00183A	Washer 3.5mm	2
*L09	0E00612A	Screw M3x6 Philips Pan Head (2A)	2
*L10	0E00773A	BT Screw M2x4 Philips Pan Head (Bronze)	4
L11			

*: Depends on the versions.

7.4. Switch Control Ass'y (B01)

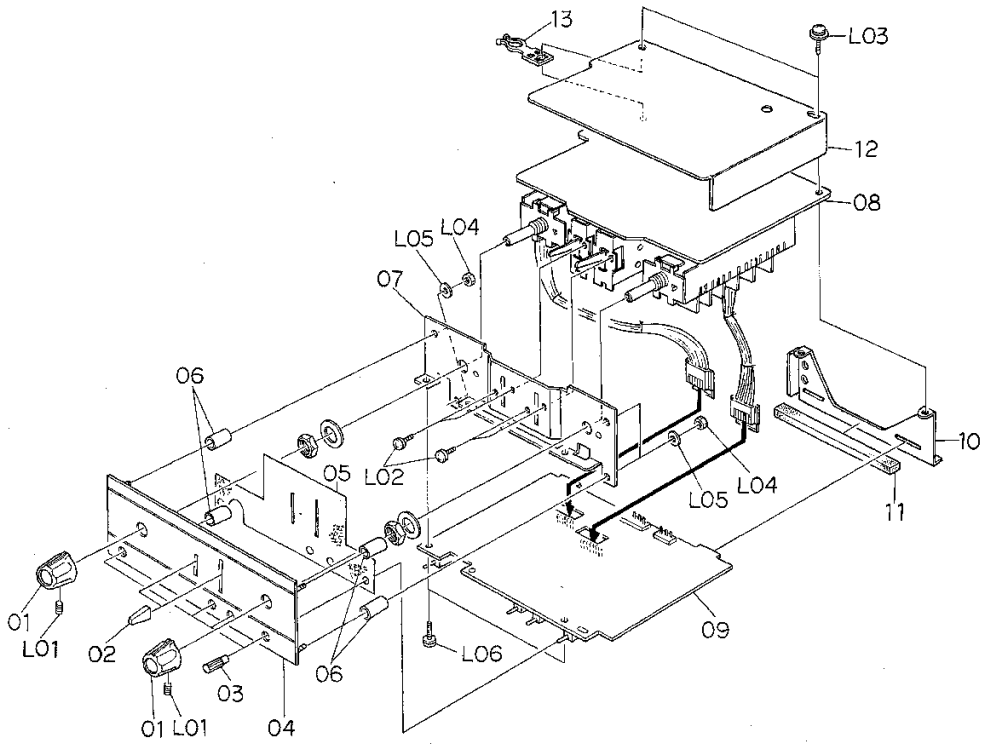


Fig. 7.4

Schematic Ref. No.	Part No.	Description	Q'ty
B01	**JA03218A**	**Switch Control Ass'y**	**1**
01	HA03729C	Rotary Switch Knob Ass'y	2
02	0H03565A	Slide Switch Knob	2
03	0H03564B	Calibration Knob	4
04	HA03730B	Front Panel Ass'y	1
05	0J03769A	Front Panel Himelon	1
06	0J03886A	Front Panel Stud	4
07	0J03746B	Switch Holder	1
08	BA03890A	Switch P.C.B. Ass'y	1
09	BA03891A	Volume P.C.B. Ass'y	1
10	0J03741D	Switch P.C.B. Holder	1
11	0J03773A	Volume P.C.B. Cushion	1
12	0J03901B	Switch P.C.B. Insulator	1
13	0B08516A	Wire Holder 583	1
L01	0E00774A	Screw M4x4 Cup Point (Hex. Socket Head)	2
L02	0E00622A	Screw M3x5 Philips Pan Head (2A)	4
L03	0E00607A	Screw M3x8 Philips Pan Head (3A)	2
L04	0E00718A	Nut Hex. M3	4
L05	0E00030A	Washer 3mm	4
L06	0E00510A	Screw M3x8 Philips Pan Head (2A)	2

7.5. Bar-graph Holder Ass'y (B02)

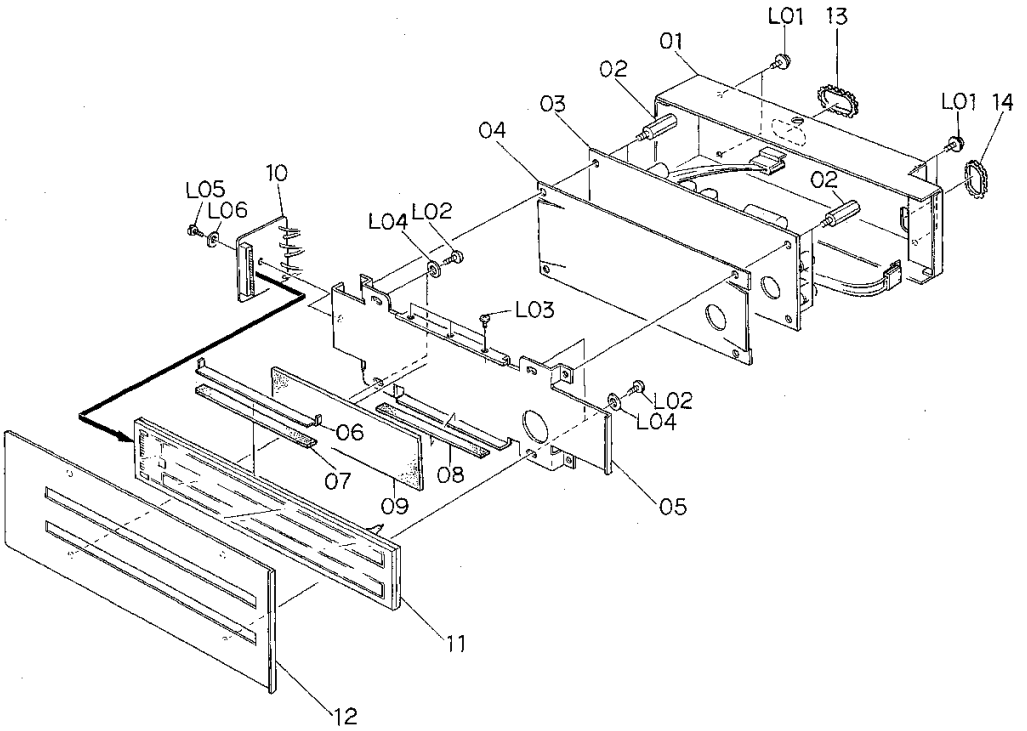


Fig. 7.5

Schematic Ref. No.	Part No.	Description	Q'ty
B02	**JA03219A**	**Bar-graph Holder Ass'y**	**1**
01	JA03204B	Shield Cover Ass'y	1
02	0J03755A	Bar-graph Stud	4
03	BA03889A	Display P.C.B. Ass'y	1
04	0J03772A	Display P.C.B. Insulator	1
05	0J03753B	Bar-graph Holder	1
06	0J03754A	Pressure Plate	1
07	0J03775B	Bar-graph Cushion A	1
08	0J03776B	Bar-graph Cushion B	1
09	0J03777B	Bar-graph Cushion C	1
10	BA03894A	8P Plug P.C.B. Ass'y	1
11	0B08416A	Bar-graph	1
12	JA03203C	Scale Panel Ass'y	1
13	0B08417A	Free Bushing 52mm	1
14	0B08426A	Free Bushing 41mm	1
L01	0E00606A	Screw M3x6 Philips Pan Head (3A)	4
L02	0E00778A	Screw M2.6x5 Philips Binding Head	4
L03	0E00826A	Screw M2x2.2 Philips Pan Head	3
L04	0E00183A	Washer 3mm	4
L05	0E00166A	Screw M2x4 Cylinder Head	1
L06	0E00779A	Washer 2mm (Bakelite)	1

7.6. Connector Ass'y (B03)

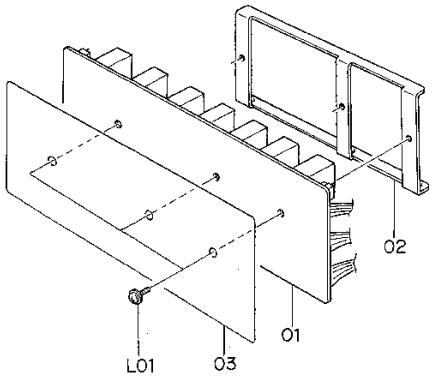


Fig. 7.6

Schematic Ref. No.	Part No.	Description	Q'ty
B03	**JA03221A**	**Connector Ass'y**	**1**
01	BA03893A	Connector P.C.B. Ass'y	1
02	0J03750A	Connector P.C.B. Holder	1
03	0J04024A	P.C.B. Insulator	1
L01	0E00607A	Screw M3x8 Philips Pan Head (3A)	3

8. BLOCK DIAGRAM

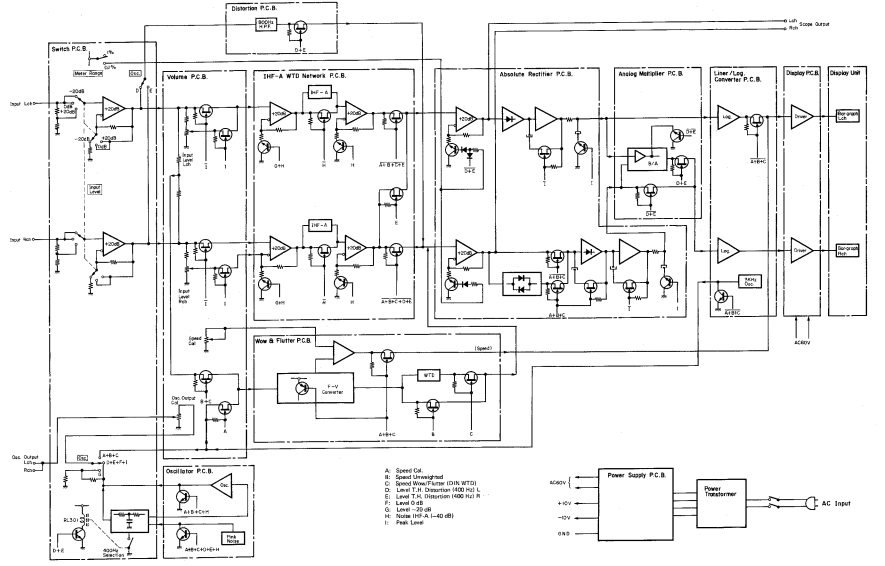


Fig. 8

9. WIRING DIAGRAM

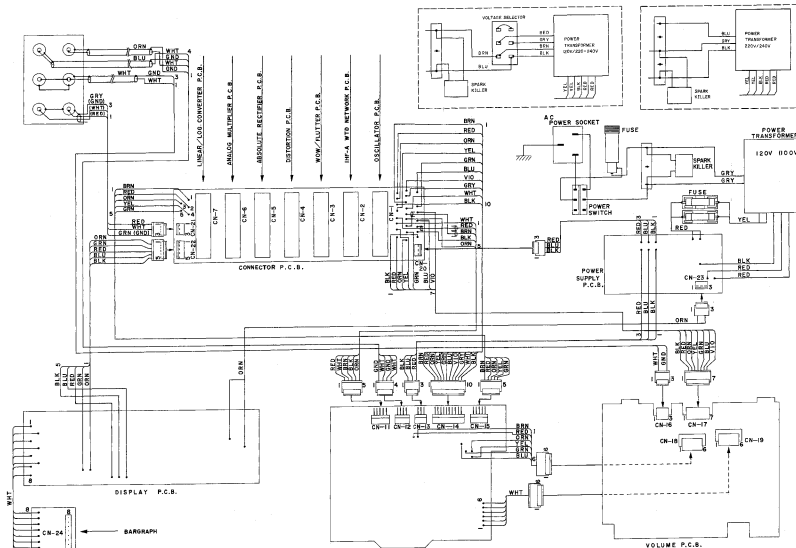


Fig.9

Note: Table of colors

BLK – Black
BLU – Blue
ORN – Orange
GRY – Gray
GRN – Green
RED – Red
BRN – Brown
YEL – Yellow
WHT – White
VIO – Violet

10. TROUBLESHOOTING

10.1. Notes

(1) Referring to the Owner's Manual, operate the Audio Analyzer T-100, and establish which circuit is in trouble.
(2) Remove the covers, the printed-circuit boards, etc., and visually check the parts, wiring or conductive pattern of the printed-circuit board for abnormalities. Various abnormalities may be found through visual check such as burnt elements, broken wires, cold soldering and loose connections of connectors.
(3) Check to insure whether the outputs +10 V and −10 V of the Power Supply Circuit are correct.
(4) Check to insure whether the output AC 60 V of the Power Supply Circuit is correct.
(5) Check the operation of circuits having trouble with a VOM or an oscilloscope according to the circuit diagram.

10.2. Troubleshooting

10.2.1. Indicators do not indicate proper value when Function Control is set to "Level"

Conditions: Input Signal — 1 kHz 1 V rms for L and R channels
Input Level SW — 0 dB
Meter Range SW — 0 dB
Function Control — Level

(1) 1 V rms is not obtained at IC301-3 and -5 on Switch P.C.B.
  (a) Poor contact or disconnection of connector CN-12
  (b) Defective Input Level Switch

(2) 1 V rms is not obtained at Outputs (L) and (R) on Switch P.C.B.
  (a) Defective IC301

(3) 1 V rms is not obtained at Inputs (L) and (R) on Volume P.C.B.
  (a) Poor contact or disconnection of wire of CN-19

(4) 1 V rms is not obtained at Outputs (L) and (R) on Volume P.C.B.
  (a) Abnormality of logic signals or defective bilateral switch Q102 or 202

(5) 1 V rms is not obtained at Inputs (L) and (R) on IHF-A WTD Network P.C.B.
  (a) Poor contact or disconnection of wire of CN-17

(6) 1 V rms is not obtained at Outputs (L) and (R) on IHF-A WTD Network P.C.B. (or Inputs (L) and (R) on Absolute Rectifier P.C.B.)
  (a) Defective IC301 or 302
  (b) Abnormality of logic signals or defective bilateral switch Q102, 202, 104, 204 or 301
  (c) Bilateral switch Q306 or 307 on Wow & Flutter P.C.B. or Q801 on Distortion P.C.B. is ON

(7) −1.5 V DC is not obtained at Outputs (L) and (R) on Absolute Rectifier P.C.B.
  (a) Defective IC001, 002, 003, 004 or 005
  (b) Abnormality of logic signals or defective bilateral switches
  (c) Defective D703, 704, 803 or 804

(8) 1 V rms is not obtained at Inputs (L) and (R) on Linear/Log. Converter P.C.B.
  (a) Abnormality of logic signals or defective bilateral switches on Analog Multiplier P.C.B.

(9) Incorrect operating waveform at IC302-1 on Linear/Log. Converter P.C.B. (refer to Fig. 6.8.1)
  (a) Defective IC302
  (b) Defective Micro Fork TF301 or disconnection of lead wire

(10) Incorrect operating waveform at collectors Q105 and 205 on Linear/Log. Converter P.C.B. (refer to Fig. 6.8.1)
  (a) Defective exponential waveform generator
  (b) Defective differential amp. circuit

(11) +2.2 V DC is not obtained at Outputs (L) and (R) on Linear/Log. Converter P.C.B.
  (a) Defective L.P.F. circuit
  (b) Abnormality of logic signals or defective bilateral switch Q302
  (c) Bilateral switch Q305 on Wow & Flutter P.C.B. is ON

(12) +2.2 V DC is not obtained at Inputs (L) and (R) on Display P.C.B.
  (a) Poor contact or disconnection of wire of CN-22

(13) Approx. 60 V AC is not obtained at AC voltage input on Display P.C.B.
  (a) Poor contact or disconnection of wire of CN-23

(14) Approx. 250 V DC is not obtained at emitter of Q709 on Display P.C.B.
  (a) Defective high-voltage generator
  (b) Defective ripple filter

(15) Incorrect operating waveforms at various parts
  (a) Defective ICs
  (b) Defective transistors or bilateral switches

(16) When all of the above are normal, this will indicate
  (a) Poor contact or disconnection of wire of CN-24
  (b) Defective Bar-graph, etc.

10.2.2. Indicators do not indicate the proper value when Function Control is set to "Level T.H. Dist. L or R"

Conditions: Input Signal — 400 Hz 1 V rms (Distortion: 1% @ 1 kHz)
Input Level SW — 0 dB
Meter Range SW — 0 dB
Function Control — Level T.H. Dist. L or R

(1) 400 Hz 1 V rms is not obtained at Input on Distortion P.C.B.
  (a) Poor contact or disconnection of wire of CN-19 or CN-17 on Volume P.C.B.

(2) 1 kHz 320 mV rms is not obtained at Output on Distortion P.C.B. (or Input (R) on Absolute Rectifier P.C.B.)
  (a) Defective active filter circuit (IC801 or 802)
  (b) Abnormality of logic signals or defective bilateral switch Q801 on Distortion P.C.B.
  (c) Abnormality of logic signals on IHF-A WTD Network P.C.B. or Wow & Flutter P.C.B.

(3) 400 Hz 1 V rms is not obtained at Output (L) on IHF-A WTD Network P.C.B. (or Input (L) on Absolute Rectifier P.C.B.)
  (a) Abnormality of logic signals on IHF-A WTD Network P.C.B.

(4) −1.5 V DC and −580 mV DC are not obtained at Output (L) and Output (R) on Absolute Rectifier P.C.B. (or Input (L) and Input (R) on Analog Multiplier P.C.B.)
  (a) Abnormality of logic signals on Absolute Rectifier P.C.B.

(5) −1.5 V DC is not obtained at Output on Analog Multiplier P.C.B. (or Input (R) on Linear/Log. Converter P.C.B.)
  (a) Defective IC751, VF Converter or differential amp. circuit (refer to operating waveform in Fig. 6.13.1)
  (b) Abnormality of logic signals or defective bilateral switch

(6) +2.2 V DC is not obtained at Output on Linear/Log. Converter P.C.B.
  (a) Abnormality of logic signals on Linear/Log. Converter P.C.B.
  (b) Abnormality of logic signals on Wow & Flutter P.C.B.

10.2.3. Indicator does not indicate the proper value when Function Control is set to "Speed Cal."

Condition: Function Control — Speed Cal.

(1) Sine wave 3 kHz approx. 0.7 V rms is not obtained at 3 kHz Output on Linear/Log. Converter P.C.B.
  (a) Abnormality of logic signals, or short circuit of Q303
  (b) Defective IC302

(2) 3 kHz approx. 0.7 V rms is not obtained at W/F Output on Volume P.C.B.
  (a) Poor contact or disconnection of wire of CN-19
  (b) Abnormality of logic signals or defective bilateral switch Q302
  (c) Defective Q307

(3) 3 kHz approx. 0.7 V rms is not obtained at Input on Wow & Flutter P.C.B.
  (a) Poor contact or disconnection of wire of CN-17

(4) Incorrect operating waveform at IC302-3 on Wow & Flutter P.C.B. (refer to Fig. 6.4.2)
  (a) Defective limiter circuit, differential circuit or VF converter circuit
  (b) Abnormality of logic signals
  (c) Defective Q302

(5) +1.6 V rms (varied by Speed Cal. VR302 on Wow & Flutter P.C.B.) is not obtained at Speed on Wow & Flutter P.C.B.
  (a) Defective L.P.F. circuit or DC amp. circuit
  (b) Defective VR302 on Volume P.C.B.
  (c) Abnormality of logic signals on Linear/Log. Converter P.C.B.

10.2.4. Indicators do not indicate the proper value when Function Control is set to "Noise-A"

Conditions: Input Signal — 1 kHz 100 mV rms for L and R channels
Input Level SW — −20 dB
Meter Range SW — 0 dB
Function Control — Noise-A

(1) 1 V rms is not obtained at Outputs (L) and (R) on IHF-A WTD Network P.C.B.
  (a) Abnormality of logic signals or defective bilateral switch Q101, 102, 104, 201, 202 or 204
  (b) Defective D101, 102, 103, 201, 202 or 203

(2) Disconnect input signals. But still appearance of unwanted oscillation on Scope Out indicates;
  (a) Abnormality of logic signals or defective Q304 on Oscillator P.C.B.
  (b) Defective D304 on Oscillator P.C.B.

10.2.5. Indicators do not indicate the proper value when Function Control is set to "Peak Level"

Conditions: Input Signal — 1 kHz 1 V rms for L and R channels
Input Level SW — 0 dB
Meter Range SW — 0 dB
Function Control — Peak Level

(1) 640 mV rms is not obtained at Inputs (L) and (R) on Absolute Rectifier P.C.B.
 (a) Abnormality of logic signals or defective bilateral switch Q101 or 201 on Volume P.C.B.
 (b) Defective D101 or 201 on Volume P.C.B.

(2) −1.5 V DC is not obtained at Outputs (L) and (R) on Absolute Rectifier P.C.B.
 (a) Abnormality of logic signals or defective bilateral switch Q702, 703, 802 or 803
 (b) Defective D705, 706, 805 or 806

10.2.6. Indicator does not indicate the proper speed value when Function Control is set to "Speed Wow/Flutter" or "Speed Unweighted"

Conditions: Input Signal — 3 kHz ±0.1% 30 mV rms or more
Input Level SW — 0 dB
Speed Cal. Control — Center position
Function Control — Speed Wow/Flutter or Speed Unweighted

(1) 3 kHz signal is not obtained at W/F Output on Volume P.C.B. (or Input on Wow & Flutter P.C.B.)
 (a) Abnormality of logic signals or defective bilateral switch Q301 or 302 on Volume P.C.B.

(2) +1.6 V DC is not obtained at Speed on Wow & Flutter P.C.B.
 (a) Abnormality of logic signals on Wow & Flutter P.C.B. or Linear/Log. Converter P.C.B.

10.2.7. Indicator does not indicate the proper wow/flutter value when Function Control is set to "Speed Wow/Flutter" or "Speed Unweighted"

Conditions: Input Signal — 3 kHz (modulated with 4 Hz sine wave by 1%)
4 Hz : 380 mV rms
3 kHz: 760 mV rms
Input Level SW — 0 dB
Meter Range SW — 0 dB
Function Control — Speed Wow/Flutter or Speed Unweighted

(1) 4 Hz 1 V peak-to-peak is not obtained at Output on Wow & Flutter P.C.B. (or Input (R) on Absolute Rectifier P.C.B.)
 (a) Defective IC304
 (b) Abnormality of logic signals or defective bilateral switch Q306 or 307 on Wow & Flutter P.C.B.
 (c) Abnormality of logic signals on Distortion P.C.B. or IHF-A WTD Network P.C.B.

(2) −1.5 V DC is not obtained at Output (L) on Absolute Rectifier P.C.B.
 (a) Defective IC003
 (b) Abnormality of logic signals or defective bilateral switch Q804 or 805

(3) −1.5 V DC is not obtained at Output (L) on Analog Multiplier P.C.B.
 (a) Abnormality of logic signals

10.2.8. Oscillator Outputs do not show the proper value when Function Control is set to "Level" and Oscillator Control is set to "20 Hz — 20 kHz"

Conditions: Oscillator Control — 20 Hz — 20 kHz
Oscillator Output Control — Max.
Function Control — Level

(1) 1.2 V rms is not obtained at OSC Output on Oscillator P.C.B.
 (a) Poor contact or disconnection of wire of CN-11 on Switch P.C.B.
 (b) Abnormality of logic signals or defective bilateral switch Q302 or 304
 (c) Defective IC304, Q301, 303, 305 or 306

(2) 1.2 V rms is not obtained at pin 4 of CN-19 on Volume P.C.B.
 (a) Poor contact or disconnection of wire of CN-19

(3) 1.2 V rms is not obtained at pin 1 of CN-16 on Volume P.C.B.
 (a) Defective VR301
 (b) Defective Q303 or 304

(4) 1.2 V rms is not obtained at Oscillator Output Jacks
 (a) Poor contact or disconnection of wire of CN-16

10.2.9. Oscillator Outputs do not show the proper value when Function Control is set to "Level" and Oscillator Control is set to "Pink Noise"

Conditions: Oscillator Control — Pink Noise
Oscillator Output Control — Max.
Function Control — Level

(1) Noise of 50 mV rms is not obtained at Pink Output on Oscillator P.C.B.
 (a) Poor contact or disconnection of wire of CN-11 on Switch P.C.B.
 (b) Abnormality of logic signals or defective bilateral switch Q307
 (c) Defective IC302, 303, Q308 or 309

11. SPECIFICATIONS

General

Input Impedance	50 kilohms
Scope Out	Low Impedance

Oscillator (CR-type spot oscillator)

Spot Frequencies	20, 40, 63, 100, 160, 250, 400, 630, 1 k, 1.5 k, 2 k, 3 k, 4 k, 5 k, 6.3 k, 8 k, 10 k, 12 k, 15 k, 18 k, 20 kHz plus pink noise (±2 dB, 20 – 20,000 Hz)
Output Voltage	1.2 V max. (variable)
Level Deviation	±0.2 dB (20 – 20,000 Hz)
Output Distortion	Less than 0.3% (20 – 20,000 Hz) Less than 0.01% 400 Hz (for THD measurement)
Frequency Accuracy	±2%
Output Impedance	600 ohms

Level Measurement

Range	–80 dB – +30 dB (ref.: 0 dB = 1 V)
Frequency Response	20 – 20,000 Hz ±0.3 dB
Ballistics	Average (rms): 0.3 sec ("VU") Peak: 10 ms rise time 2 sec fall time (DIN peak)

Wow & Flutter Measurement

Center Frequency	3 kHz
Input Level Range	3 mV – 30 V
Indication	DIN peak (wtd or unwtd, selectable)
Frequency Range	0.2 – 200 Hz
Calibration (test signal)	3 kHz ±4.5 Hz (±0.15%)
Tape Speed Range	±3%

Distortion Meter

Measurement frequency	400 Hz
Input Voltage Range	100 mV – 30 V
Distortion Range	0.01% – 0.3%, 0.1% – 3%
Automatic Input Control Range	20 dB (–10 dB – +10 dB)
Frequency Characteristics	800 Hz – 10 kHz (±0.3 dB)
Residual Noise	90 dB (input range: 0 dB) 85 dB (input range: –20 dB)

Noise Level Measurement

Frequency Characteristics	IHF-A Curve
Range	–100 dB – –10 dB (0 dB = 1 V)
Indication	Average Value
Power Requirements	100, 120, 220 – 240 Volts AC, 50/60 Hz
Power Consumption	15 VA
Dimensions	343(W) x 75(H) x 240(D) millimeters 13½(W) x 3(H) x 9½(D) inches
Weight	4.3 kilograms, 9.5 pounds

- Specifications and appearance design are subject to change for further improvement without notice.

Service Manual

Nakamichi T-100

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©8010:DA Printed in Japan

Printed by: Schaltungsdienst Lange, Berlin (GERMANY)